行政院所屬機關因公出國人員出國報告書

（出國類別：國際會議）

「2010 年碳排放交易夏季研習會議（ICAP Summer School on Emissions Trading for Emerging and Developing Countries）」與會情形報告

服務機關：行政院環境保護署

姓名職稱：簡副處長慧貞

派赴國家：荷蘭 海牙（**Hague, Netherlands**）

出國期間：**99** 年 **7** 月 **25** 日至 **8** 月 **8** 日

目錄

「2010 年碳排放交易夏季研習會議（ICAP Summer School on Emissions Trading for Emerging and Developing Countries）」與會情形報告

壹、 前言

國際碳行動夥伴組織(International Carbon Action Partnership, ICAP)：係於 2007 年 10 月 29 日由歐盟、美國數州、加拿大兩省、紐西蘭、挪威等國家聯合發起的在葡萄牙首都里斯本正式成立；該組織成立目的乃全球已正式實施或已規劃透過“強制性”限量與交易制度(Mandatory cap and trade systems)來建立其碳市場的各方組織（單一國家或城市或區域），藉此平台分享彼此實施方法與障礙，以建立健全碳市場（Backbone of a Robust Carbon Market）並邁向一個全球共通性體系的最後目標。ICAP 係於去（2009）年七月底在德國柏林（BERLIN, GERMANY）舉辦第一屆碳排放交易國際研討會議，本年 2010 年 7 月 26 日至 8 月 6 日係於荷蘭海牙（Hague, Netherlands）舉行第二屆國際會議。

本(2010)年度會議目的主要係提供開發中國家與新興國家與會者，透過與來自 ICAP 會員國的決策者以及其他研究機構的代表，就碳市場機制、法規相容性等排放交易制度之能力建構等提供實務研習，並透過各國經驗相互交流，藉以促進國際碳市場之連結。據 ICAP 統計 2010 年該次會議共計自 260 多位邀請來自發展中國家之公私部門、學術等重要碳交易設計及政策制訂重要成員遴選後共計邀請有 26 位代表出席，分別來自巴西、中國、

哥倫比亞、埃及、印度、印尼、以色列、馬來西亞、墨西哥、奈及利亞、南韓、南非、台灣及泰國等 14 國家。

照片來源：ICAP 官方網站 http://www.icapcarbonaction.com/

本次會議就「氣候變遷政策工具及國際趨勢」、「排放交易設計要素」、「國際經驗」、「碳市場運作機制管理架構」等主題進行為期二週討論，包括國際談判協商進進展、清冊資料建立方法、核配量、排放量測量、報告及查證(MRV)、歐盟、RGGI 及 WCI 等議題，並透過實際演練參訪與各國代表進行交流與討論；另外，亦強調應避免碳洩漏之問題，提出相關市場風險管理，創造需求以擴展市場等觀點，共同為建置國際碳市場連結之展望而努力。

貳、 出國行程

2010.7.25~7.26　　啟程至荷蘭阿姆斯特丹

2010.7.26~8.6　　參與 ICAP 會議活動

2010.8.7~8.8　　返程、回到台北

參、 會議過程紀要

一、 2010 年 7 月 26 日

1. 議題：Climate change an introduction into the science and economics

■ 講者：Mr. Andries Hof

■ 摘要：

(1) 從科學及經濟觀點簡單說明氣候變遷的影響，另從全球及區域觀點說明相關因應之行動，屬相當好的入門教材。

(2) 認為目標設定係從 Risk-based approaches 及 Cost-benefit analysis 兩方面評估。

(3) 倘欲達到 2100 年降至 400ppm 的條件，可能是推動 BECS(BioEnergy+CCS)，與署長所述的 Biochar 想法一致，該簡報亦認為台灣地區適合發展生質能(參見該簡報 p29)。

(4) 先進國家須要付出 2%GDP 之減量成本，然對於非洲及印度，係提高 GDP。

(5) 認為能源結構須大幅改變、成本之外的障礙要

突破、對改變之急迫感等，才能朝向正確的方向前進。

二、 2010 年 7 月 27 日

1. 議題：Choosing Instruments in Climate Policy：Theory and Practice

■ 講者：Mr. Benjamin Görlach

■ 摘要：

(1) 此課程係從理論及實務兩面向來探討如何運用現有的溫室氣體減量“工具”來訂定合適的氣候政策。

(2) 作者歸類出四種現有的政策手段: (1)經濟手段(如: 碳排放交易制度、環境稅、補貼等)，(2)管制手段(如: 絕對減量、效能標準等) (3) 勸說手段 (如: 提升環保意識、加強環境教育等) (4)自願式協議 (如: 訂定部門減量策略，確立減量目標與時程，及彈性自願減量機制等)。

(3) 內容還提到如何選擇不同的減量“工具”整合運用在適當的策略上。最後，作者表示碳排放交易制度是保護氣候的基石，可用低成本降低溫室氣體排放量，但仍應搭配其他政治工具來執行，並審慎評估行政負擔是否適度? 此乃可作為我國排放交易制度規劃的參考。

2. 議題：Establishing an Emissions Trading System: Design Elements and Choices

■講者：Mr. Nicholas Bianco

■摘要：

(1) 本課程係介紹建置排放交易系統(ETS)所需之步驟及各設計要素，並且說明各要素所需考量之項目。

(2) ETS 建置步驟依序為確定法源依據、建立排放量資料(Measure, Monitor, Record, Verify, MMR&V)、決定基準排放量、設定總量、總量核配、建置系統規則及基礎設施。

(3) 抵換計畫應符合真實(real)、外加性(additional)、可查證(verfiable)、永久性(permanent)以及可執行(enforceable)等原則。

(4) 對於剛起步之 ETS 可配合一些暫時的彈性機制，例如較長的遵約期、儲存與借貸、及先期減量額度。

(5) 如何達成減量目標有賴於價格訊號的建立以鼓勵創新、減量目標的可預測性供投資者及受規範者依循、及穩健的推動以減少日後的修改。

三、 2010 年 7 月 28 日

1. 議題：From Climate to Trading

■講者：Mr. Pedro Martins Barata

■摘要：

(1) 介紹國際氣候政策之歷史摘要、京都機制與其

下的三種跨國減量機制(CDM/JI/ET)，另，探討歐盟的排放交易制度(The EU ETS)未來是否可以跟國際(US ETS、NZ ETS、Japan or China 等系統)接軌。

(2) 提出幾個問題包括 CDM 在各國的可行性、延伸性，各國是否應該要設計總量管制與排放交易的機制，及未來 2020~2050 年間的碳市場走向，皆值得我國思考及探討。

2. 議題：Why do we need new market mechanisms?

■ 講者：Mr. Gerie Jonk

■ 摘要：

(1) 此課程說明為什麼我們需要新的市場機制，主要是全球已開發國家在 2020 年需要抵換之碳權 >4-6 G ton，需要在發展中國家的減量貢獻有 6-8 G ton(不含已開發國家之抵換碳權)，因此需要利用市場工具來支持發展中國家轉換至低碳經濟。

(2) 政策工具需要市場投資來支持，因為市場有效的減量是最便宜的，同時市場可以引導減量成本朝最有效益方向進行，其政策工具為排放交易及抵換。另一個思考方向：以公司為基礎的全球總量管制及交易。

(3) 新碳市場工具是部門交易，優先進行關鍵排放源，包括能源、排放強度較強之工業；全世界

技術可行之先進部門；國際間競爭的部門－碳洩漏；高減量潛力之部門(能源效率提升)。

(4) CDM 需要重新改革，尤其在管理及統一的基線上，另外需要在發展中國家增加重要部門減量之機制；因此未來我國若進行境外碳權經營須注意 CDM 之改革管理方向。

3. 議題：Emerging Greenhouse Gas Markets

■ 講者：Mr. Nicholas Bianco

■ 摘要：介紹歐盟排放交易制度的特色，美國早期實施總量管制與排放交易的成功案例(酸雨計畫)，及 2 個美國國內的交易系統組織：中西部溫室氣體減量協議（Midwestern Greenhouse Gas Reduction Accord, MGGRA）、東北部的區域溫室氣體倡議（Regional Greenhouse Gas Initiative, RGGI）與目前規模最大的 Western Climate Initiative (WCI)交易系統的特色，可作為我國未來實施總量管制及規劃排放交易系統的參考。

四、 2010 年 7 月 29 日

1. 議題：Emissions Trading in the European Union; History, Development and Review of the EU ETS

■ 講者：Mr. Jill Duggan

■ 摘要：

(1) 本課程主要介紹歐盟排放交易系統的發展歷史及現況，並分析過去經驗所得之教訓，為未來

發展提供建議。

(2) EU ETS 規劃分兩階段：第一階段(2005-2007)為學習期；第二階段(2008-2012)為京都議定書承諾期。

(3) 第一階段主要遭遇的困難除了因缺乏排放量資料造成的超額核配外，大多數國家因準備時間和經驗不足及政策壓力下使得初期需要反覆修改所提交的計畫(National Allocation Plan, NAP)。

(4) 第一階段所建立的排放量資料為第二階段實施之基礎。第二階段核配大多以歷史排放量(Grandfather)方式，部分英國部門使用標竿值(Benchmark)。約 3%額度用於拍賣。故我國在設計交易制度時，應考慮先行規劃實驗階段以利往後運作。

(5) 為因應 2013 年後京都時期，歐盟將不再要求各國提交 NAP，而是由歐盟直接設定總量，減量計畫額度使用佔比須低於絕對減量的 50%，2020 年之前規劃超過 60%額度用於拍賣。因此減量計畫額度之上限額度值得我國慎重思考。

2. 議題：

◆ New Zealand Emissions Trading Scheme

■講者：Mr. Dave Hoskins

◆ Program Design Recommendations for the WCI

Regional Program

■講者： WCI Stakeholder Call

◆ Lessons from the Regional Greenhouse Gas Initiative

■講者： Mr. Nicholas Bianco

◆ Reducing GHG Emissions in the U.S.

■講者： Mr. Nicholas M. Bianco & Franz T. Litz

■摘要：

(1) 介紹相關國家或區域排放交易制度之設計及執行經驗，同時介紹美國不同減量情境的採行策略。

(2) NZ ETS 交易期為 2010 年 7 月到 2012 年 12 月為止，其交易涵蓋範圍包含六種溫室氣體及所有部門別，紐西蘭之總量設定依循京都議定書承諾，同時京都機制所得之減量額度也可使用於 NZ ETS。NZ ETS 設定溫室氣體固定交易價格為$25/噸，亦設有獎勵與罰則機制。NZ ETS 於 2013 年後的發展方向將根據各國發展而定。

(3) WCI 為美國、加拿大、墨西哥等國中 12 州(省)結合的聯盟，係以 2020 年減量至較 2005 年下降 15%為共同減量目標，其排放交易涵蓋近 90%的排放量，預計 2012 年開始施行，目前仍持續討論評估相關政策及方案，並積極與聯邦政府合作，推動全國區域協調工作。

(4) 依據美國聯邦政府現有的氣候策略及行動方

案，如：新污染源績效標準(New Source Performance Standards), 汽車排放標準(Vehicle Emissions Standards)，民航機排放及操作標準(Emissions and Operational Standards for Aircraft)等，以不同的情境及方案(低、中、高案/絕對減量)分別計算出未來 2020 年和 2030 年的溫室氣體排放減量百分比，作為依據。

3. 議題：

◆ ECN research activities on EU emissions trading

■講者：Mr. Jos Sijm

◆ CDM activities by ECN

■講者：Mr. Stefan Bakker

■摘要：

(1) 此課程主要係摘述荷蘭能源研究中心(ECN)針對歐盟排放交易及 CDM 執行情形的研析報告。

(2) ECN 針對 EU ETS 之總量額度核配機制對能源部門方面之影響利用各項分析工具進行分析，結果顯示(1) 能源價格上揚且獲利增加；(2) 能源之使用趨勢由石化燃料向天然氣/生質能轉移；(3) 額度拍賣較免費核配適宜；(4) 排放量減少。

(3) 歐盟會員國引進 CERs 數量平均約在 10%左右(2009：78MCERs，4.2% of permit)。ECN 評析在非洲執行 CCS 應屬可行之 CDM 專案，2010

年於 4 個非洲南部國家正在評析中。

(4) ECN 並分析 CDM 執行成本，發現如將避免毀林納入，每年約可增加 1000MtCO2 當量之減量空間，每年約 4200MtCO2 當量之單位減量成本低於 20 歐元。然減量超過 6000MtCO2 當量，其單位減量成本可能將超過 100 歐元。

(5) ECN 認為若強化在開發中國家執行住商部門及運輸部門 CDM 專案，應可同時解決空氣污染問題，此議題也納入 Supported NAMAs 討論中。

五、 2010 年 7 月 30 日

1. 議題：排放交易制度的範疇設定（Scope and coverage of an emission trading scheme）

■講者：Mr. Joelle Rekers

■摘要：

(1) 該講者為荷蘭經濟部的政策顧問 Ms. Joelle Rekers，是研擬荷蘭國家核配方案 NAP（National Allocation Plan）的幕僚之一。

(2) 設計排放交易制度的範疇，包括管制的溫室氣體種類和納入管制的部門別。選擇的重點包括：

◆排放源是否有達到 MRV 的能力：應確認可監督排放量、其不確定性的可接受程度、確認資料可收集性以作為核配的基礎、排放源的邊界等。

◆排放源的重要性：應評估既有、未來及有成長性的排放源之 GHG 排放量。

◆參與交易制度成本的平衡性：考量排放源的數量與大小

◆考量既有政策與法規的交互作用，以維護參與部門別間的公平競爭性，並排除已有效益方案者。

(3) 排放交易制度的涵蓋範疇（部門別）的考量因子，包括環境效益、經濟效益、投資成本、企業競爭性、企業員工等。

(4) 歐盟 ETS 制度在第一階段（2005-2007）時，是邊學邊做的模式進行，雖然僅針對大型且固定的 CO2 排放源，管制的總溫室氣體排放量僅佔歐盟排放量的 37%，但這一階段的工作奠定了 MRV 制度的基礎。後續擴大範疇後不僅可加強系統的環境效益，且引進新的減量機會到排放交易系統中。

(5) 雖然全球 GHG 排放量有 20%是來自森林砍伐時（60 億公噸 CO2），若可納入 ETS，具較大的環境效益。但因考量其未有永久持續性的減量（皆為暫時性，甚至有逆轉性），具有較高風險，且仍需要有比較性的 MRV 標準，因此，LULUCF 尚未納入歐盟 ETS 和 CDM 制度。

(6) 歐盟的陸上交通佔 19%歐盟排放量（875 百萬

公噸 CO2），是一個快速成長的部門（1990 至 2004 年間成長 26%），評估結果僅有環境效益是正面的，在經濟效益、投入成本、市場衝擊等方面皆為負面，因此仍須從長計議。此外，佔全球排放量 2-5%的海上運輸方面，評估將持續成長，因此歐盟認為若無國際管制方案時，將會考量納入歐盟 ETS。

(7) 歐盟針對佔其排放量 3%的航空部門，因該部門在最近 10 年有 87%的高成長率，且評估具環境與經濟效益，且對投資成本和市場衝擊影響不大，因此已納入歐盟 ETS。

(8) 歐盟的排放源排除條款是排放量（10 或 25 千公噸）、年生產量、設備容量（20MW）等。其中設備容量，若同一廠址有許多超過 3MW 的小設備，加總超過 20MW 即應納入 ETS 制度。

(9) 歐盟現在第二階段的 ETS，不僅國家增加至 27 個會員國＋挪威、冰島、列支敦斯登，溫室氣體種類也擴大到京都議定書管制的六種氣體，涵蓋的設備數量高達 12,000。自 2012 年起增加航空部門，自 2013 年起增加石化、製鋁、製氨、N2O（肥料）、PFCs（製鋁）、CCS 等部門，而 2013 年後醫院部門不再納入。

Activity/scope	2008-2012	2013-2020
Combustion installation	> 20 MW	> 20 MW
Oil refineries	+	+
Cement	+	+
Pulp& Paper	+	+
Glass	+	+
Lime	+	+
Steel	+	+
Ceramics	+	+
Chemicals	+/_	+
Petrochemicals	-	+
Aluminium production	-	+
Ammonia production	-	+
N_2O (fertilizers)	-	+
Perfluorcarbon from alumium production (PFC's)	-	+
CCS	-	+
Aviation	-	+ (from 2012)
Hospitals	+	-
R&D installations	-	-
Biomass	-	-

2. 議題：資料收集與盤查工具和方法（Tools and Methods for Data Collection and Inventory Generation）

■ 講者：Mr. Benjamin Görlach

■ 摘要：

(1) 講者為 Ecologic Institute 的資深研究員 Mr. Benjamin Görlach，先前在德國環境署的排放交易部門工作（2007-2008 年）。

(2) 歐盟排放交易制度規範指令於 2003 年公告並生

效，核配量計算依溯往原則（grandfathering），計算 2000-2002 年排放量，訂定各國國家核配方案 NAP（National Allocation Plan）表格，但此非實際核配量的最終結果。

(3) 德國依據 UNFCCC 執行計算的國家排放清冊，雖涵蓋全國排放源和六種溫室氣體，但其部門別定義、排放源排除門檻皆和歐盟排放交易制度不同，因此國家排放清冊的資料無法直接被作為建立符合排放交易制度的資料收集方法。不過，清冊中排放量的計算方法仍具有價值且可被使用，例如排放係數。此外，清冊的數據，也可以被利用作為交叉比對、一致性比對及大規模計算時使用，但無法提供設備排放源層級的數據。

(4) 德國的 Ambient Pollution Control Act 管制超過 90 個污染物（空水土壤），針對產業的設備排放源，每年有依規定應申報的數據。這項資料對溫室氣體盤查資料收集有很大的助益，但仍非萬能，因為設備排放源的定義有些不同，且 ETS 的部門別涵蓋範疇並非僅有此 Act。

(5) 參與溫室氣體排放量盤查與排放交易工作的單位包括聯邦環境部、環境署（包括排放交易部門）負責排放交易工作，各聯邦省負責核發操作許可並依據 Ambient Pollution Control Act 收

集排放量報告，其他相關利益團體還包括產業工會(BDI)、交易協會（DIHK）等，以及外部專家群（包括講者目前工作單位 Ecologic Institute）。中央和地方應一起合作。

(6) 德國溫室氣體排放量盤查收集程序分為三階段：數據資料收集、資料分析（一致性確認與重複驗算）、公開諮詢（尚在規劃執行中）。

(7) 德國在數據資料收集階段分為兩個步驟：

(A) 第一步驟：於 1-2 月收集可獲得的證據資料

- 包括各排放源依據 Ambient Pollution Control Act 提交的特定報告、各聯邦省收集的相關資料等。
- 但這些資料僅有 2000 年（缺 2001-2002 年），且缺乏 2000 年以後新排放源的資料，並非涵蓋所有排放源（例如缺造紙業），且僅有部分 CO_2 排放量。

(B) 第二步驟：於 3-5 月收集詳細資料

- 「探查操作設備」：由排放源自願提報 2000-2002 年間的資料，包括設備細節、設備操作者資料（聯絡人與合法設置相關資料）、使用的燃料種類/數量、生產量或容量類別/數量/利用率、熱值、排放係數等。德國在這階段共有 1,600 個自願回覆資料，佔最後總排放源數量的 80%，且其總排放量佔 95%以上。

■ 可和產業工會合作，取得所有設備排放源資料。另使用網路上傳平台收集資料（應提供正確格式、完整資料收集方法等），可先由特定排放源試行。

(8) 資料評估工作階段：和各聯邦省進行完整性查證，以及針對重要排放源進行真實性查證，必要時可由聯邦環境署的部門別專家指正。德國的經驗中，曾發生的錯誤包括單位混亂、輸入錯誤、量的 order 數錯了等，另有一些為表現先期行動而錯誤申報的情形。

(9) 歐盟 ETS 經過七年後，目前是進行數據監督的工作，包括查證 2000-2003 年基線排放量數據和 2003-2009 年的六年排放量交易數據。

3. 議題：核配量分配經驗（Allocating Allowances in an Emissions Trading System: Options, Implications and Experience）

■ 講者：Ms. Jill Duggan

■ 摘要：

(1) 講者為英國能源與氣候變遷部的資深政策官員 Ms. Jill Duggan，自始即參與規劃執行英國排放交易制度。

(2) 任何種類核配量的免費或販售的經濟價值理論皆相同，價值皆是取決於市場的需求與充裕度。

(3) 完善的拍賣制度設計可讓排放交易制度有特別

的優點：

- 更有效益：企業花錢購買需要的數量，而非免費獲得。
- 可透露出市場價格：可知是否有足夠的比例被拍賣或是不足。
- 較免費核配更能加速行為改變且更又效率。
- 可提供更大和非常令人上癮的投資流。

(4) 對於小的排放源而言，會需要利用拍賣制度獲得碳額度，因為可能市場上未有仲介商願販售少量碳額度。

(5) 未提供機會給有心人士玩弄和操作，因為若有大量配額被冗斷或被以奇怪的手法購買，在較大的市場即可輕易發現，也會比較貴。

(6) 有規律且頻率高的拍賣方式較每年才拍賣一次好。目前 RGGI 和 EU ETS 皆是使用拍賣的方式。RGGI 的市場監督網站有好的管理規範，而 EU 的拍賣平台需依循 Markets in Financial Instruments Directive(MiFID)執行。

(7) 英國第二階段的拍賣模式中，會利用一些仲介（intermediaries, 即大家熟知的 primary Participants）以 EU ETS 參與者的身分收集和出價至拍賣平台。目前有 7 個仲介者，雖然主要是投資銀行家，但這個角色也可以由其他組織替代。這些仲介可以用自己的帳號出價。

(8) 這些仲介是由英國政府認可有符合要求者。

(9) 歐盟正在研議 2012 年後的免費配額方案，今年年底才會定案。

(10) 歐盟將排放管制總量的 5%留給新的管制源。

(11) 使用溯往原則（grandfathering rule）將歷史排放量作為基線其實並非最佳方案，僅能算第二或第三好的方案，但最初採用這種原則，只因缺乏時間發展更好的基線值。

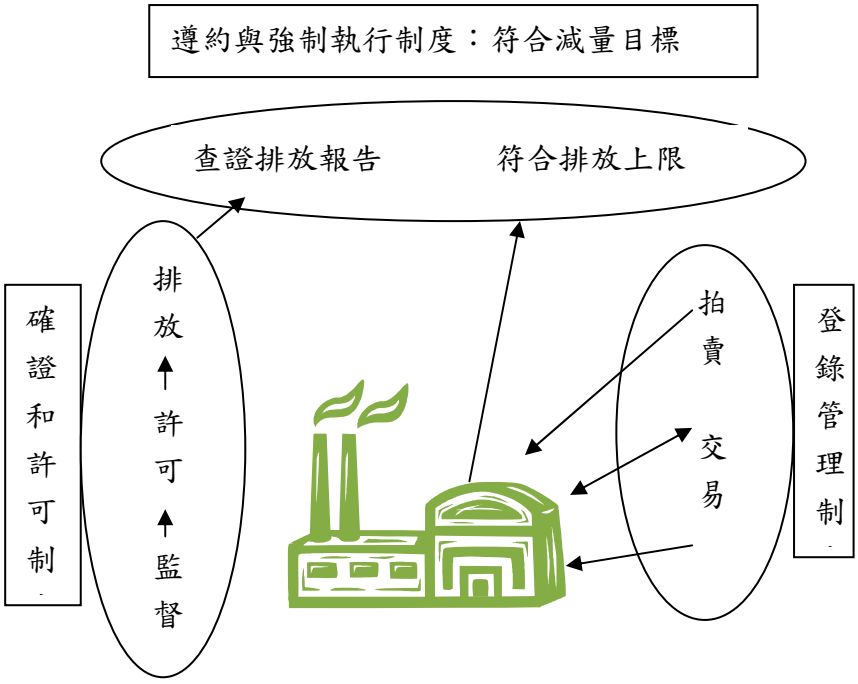
六、 2010 年 8 月 2 日

1. 議題：參訪荷蘭排放交易專責機構

- ◆ Introduction to the Dutch Emissions Authority Basics of Emission trading
- ◆ Validation & Permits Gateway to the emission trading system (ETS)
- ◆ Compliance and enforcement Bas Bougie and Rudolf van Nuissenburg
- ◆ Registration Emission Trading
- ◆ Training Registry

■摘要：

(1) 參訪荷蘭排放交易專責機構 NEa (Netherlands Emission Authority)了解排放交易的執行過程與方式。



(2) 荷蘭環境部在 2002 年成立專責之排放管理機構 NEa，獨立管理荷蘭的溫室氣體排放配額核配、監督、排放上限達成管理、註銷等工作。

(3) NEa 機構有 3 個部門：確證與許可證部門、登錄管理部門、遵約與強制執行部門。共計管理 143 個 CO2 排放許可證、90 個 NOx 排放許可證、240 個 CO2/NOx 排放許可證，管理 CO2 排放量 81.1 百萬公噸、NOx 排放量 59.2 千公噸。

(4) 確證與許可證部門的主要工作為檢視監督計畫（Monitoring Plan, MP）、核發排放許可證（2010 年共有 465 許可證）、評估通知、核發 NOx 選擇退出。工作方法是區別排放與確證計畫。

(5) 依循歐盟監督與報告準則實施國家移轉的配額監督。

(6) 確證與許可證部門和遵約與強制部門兩者的角

色分別如下：

確證與許可證部門	←→	遵約與強制部門
監督計畫 排放許可證		實際情形 排放量監督
理論值	？ =	實際值

(7) 企業溫室氣體管理會進行的稽核工作分為三階段：企業內部稽核、由認可稽核機構進行外部稽核、NEa 的遵約與強制執行性稽核。

(8) Nea 的遵約與強制執行部門負責管理可執行企業稽核工作的稽核者和公司的內部稽核。

(9) 荷蘭的登錄平台如同網路銀行，可移轉排放配額，但非移轉金錢。是一個有安全性管理的網站，須有使用者帳號與密碼方能登錄。目前約有 650 個帳號，包括將近 400 個是排放源開立的帳號，有 250 個個人帳號（大部分在荷蘭境外）。每個帳號約有 2 個代表人。

(10) 每年的工作循環是：Nea 於 2 月 28 日以前核發 CO2 排放配額給排放管制源，而排放管制源應於隔年 3 月 31 日以前申報其已經過查證的排放量報告給 Nea 並登錄於平台，再於次月（4 月 30 日）以前完成符合排放上限的工作。

(11) 排放源若於 4 月 30 日以前未達成符合排放上限時，會有一噸 CO2 處罰 100 歐元且隔年仍應完成符合上限的責任等罰則。

(12) 排放交易範例說明：分別將 1000 配額分配給兩家企業，有一家企業的實際排放量是 1200（應購買 200 以符合排放上限），另一家企業的實際排放量是 800（有 200 配額可以販售）。

(13) Nea 僅有執行配額移轉的工作，並未有財務相關的合約約定。而企業執行排放交易的財務工作由雙邊、交易平台、仲介等共同完成。

2. 議 題 ： Monitoring, Reporting, Verification, Compliance and Enforcement in Emission Trading Schemes

■講者：為德國銀行 KfW

■摘要：

(1) 德國銀行 KfW 協助於開發中國家執行減量計畫。

(2) 歐盟的 MRVCE 包括監督、報告、查證、遵約、強制符合等。

(3) 歐盟的燃料排放量計算方法是活動數據 x 排放係數 x 氧化係數，其中針對各因子的規範如下，Tier 1~4 是指精準程度：

	活動數據	淨熱值	排放係數	氧化係數

Tier 1	± 7.5%	IPCC 標準值	MRG 的預設值	MRG 的預設值
Tier 2	± 5.0%	國家標準值	國家標準值	排放源特定分析值（ISO 17025）
Tier 3	± 2.5%	排放源特定分析值（ISO 17025）	排放源特定分析值（ISO 17025）	
Tier 4	± 1.5%			

(4) 歐盟也有訂定每年報告排放量的不確定上限值。分別針對每年石化燃料的 CO2 排放量程度不同有不同的規範：相等或低於每年排放量 50 千公噸的上限值是± 7.5%，相等或低於 500 千公噸者是± 5.0%，超過 500 千公噸者為± 2.5%。

七、 2010 年 8 月 3 日

1. 議題：European Emission Trading system for Aviation

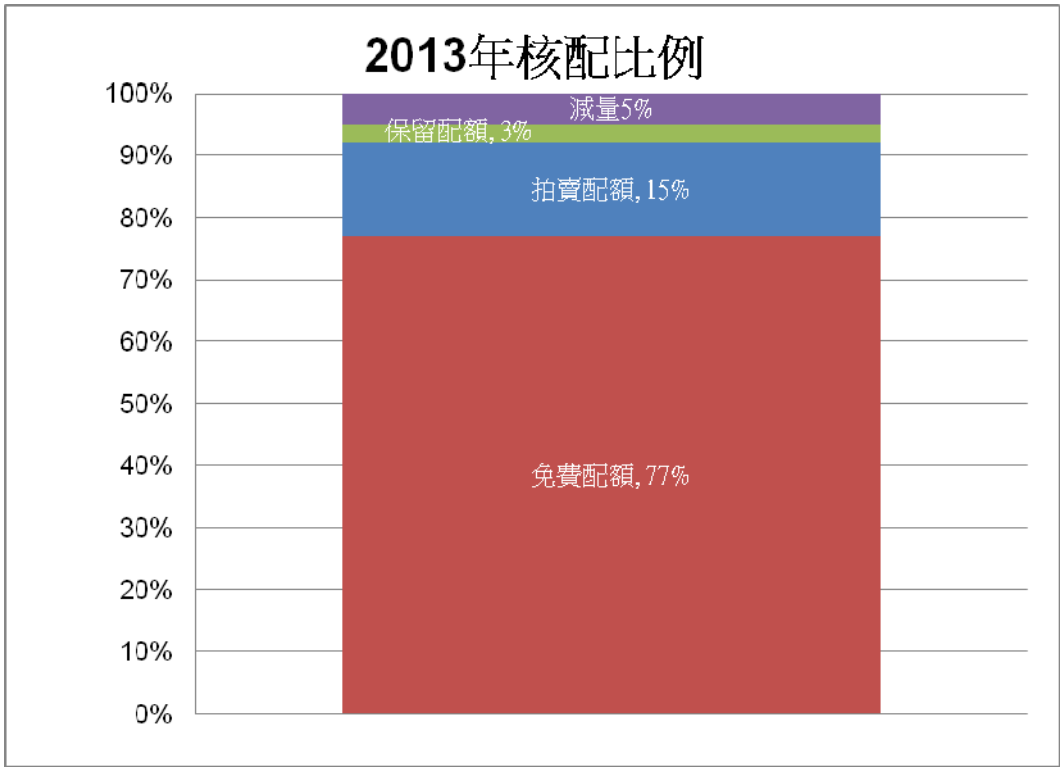
■講者：為荷蘭環境部的 Ms. Karin Verschueren

■摘要：

(1) 歐盟排放交易制度已延伸到航空領域，自 2010

年 2 月 2 日開始實施，分成 2012 年單一年和 2013-2020 年兩個階段，2010-2011 則為預備年，僅進行監測工作。

(2) 以歷史排放量（2004-2006 年平均值）訂定排放基準量，2012 年的上限值是基準量的 97%，2013 年則為 95%。另留有 15%配額進行拍賣，3%配額留給新的排放源，其餘免費核配。



(3) 所有飛抵或飛離歐洲的飛機皆被列為排放源，例外包括：

- 軍機、警察、海關
- 重量低於 5,700kg
- 目視飛行
- 循環飛行、訓練飛行、政府專機（第三國）、

醫療、救難、研究等。

- 商業航班的底線是每4個月連續3次低於243航班，或低於10,000公噸CO_2排放量

(4) 每家航空公司皆有隸屬的國家，以荷蘭為例，NEa是主管機關,共計有76家航空公司(約17.5百萬公噸)歸屬Nea管理,例如KLM, Martinair, 西北航空Northwest Airlines。

(5) 航空公司需於2009年8月31日以前提交監測方案，之後每年3月31日以前需提交前一年的排放量報告，自2013年以後每年4月30日需符合其排放上限值。

(6) 各國在2011年6月30日以前會向歐盟提交配額申請資料，2011年12月31日開始計算核配量,2012年以後每年2月28日移轉國家核配量給各航空公司。

(7) 估計航空公司因排放交易制度轉嫁至消費者的機票價格將上漲約5-20歐元。

(8) 歐盟飛航碳排放交易制度可能會有的碳洩漏是原本可直航的班機改為增加停留點，以減少至歐洲的航線距離。

(9) 若未達成符合排放上限時,會有一噸CO2處罰100 歐元且隔年仍應完成符合上限的責任等罰則，且將公開公佈航空公司名單（有損公司形象）。如果航空公司仍堅不履行減量責任，將

訂定禁止該航空公司繼續飛行的禁令

(10) 目前美國大陸航空和聯合航空正依違反航空界的芝加哥公約採法律途徑進行辯論。

2. 議題：Implementing the ETS in the Netherlands

■ 講者：荷蘭環境部的 Ms. Eva Thompson

■ 摘要

(1)說明荷蘭政府如何遵循歐盟排放交易制度。

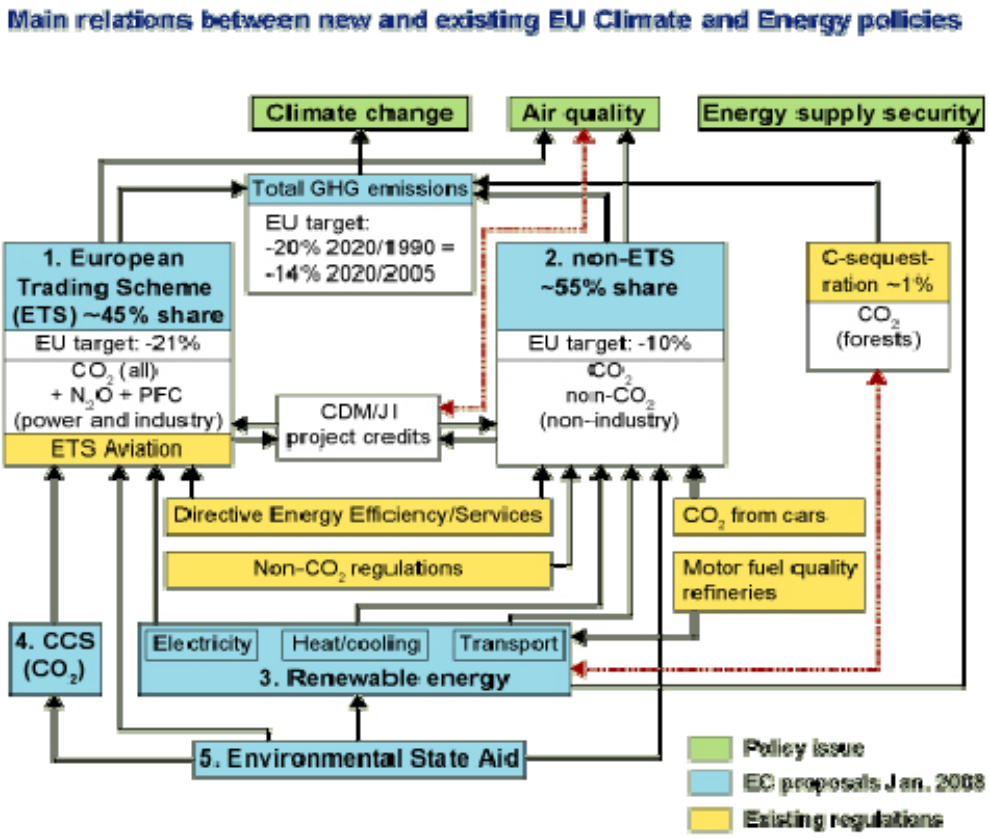
(2)荷蘭政府首先需將二氧化碳的減量目標分為使用排放交易制度 ETS 和非使用 ETS 兩部分，並將排放交易制度指令和既有法律系統結合。

(3)首先荷蘭政府需先訂定國家核配方案 NAP（National Allocation Plan）並公佈和送交國會，任何人皆可提出異議，最後送歐盟審核。另外荷蘭政府還需訂定國家核配定案 NAD（National Allocation Decision），同樣需公佈和送交國會，任何人皆可提出異議，而若有必要時，利害相關者可於獨立法院上訴。

(4)荷蘭訂定 NAP 和 NAD 的經驗是需要提供先期減量者補償方案以及保留給新排放源的核配量。此外，荷蘭訂定 NAD，在第一階段時有 76%上訴（有 36%通過），在第二階段則有 44%提出上訴（有 8%通過）。

(5)歐盟排放交易制度約涵蓋 45%排放量，減量目

標是 21%，包括電力與工業及新增的航空業，CO2、N2O、PFCs 等。而非涵蓋於排放交易的部門則有 10%減量目標。



(6)荷蘭政府為實施排放交易制度，訂定荷蘭相關法令花費過長時間很難符合歐盟指令的規定時間，且需要訂定允許範疇、特定允許情形、查證方法、制裁方法等。

(7)歐盟的排放交易制度是一個自由市場，任何人皆可參加，但也造成增值稅詐欺、洗錢、詐騙者、釣魚手法等欺詐事件。

(8)公平核配是重要的原則，但 100%正確很難達

成，因此一定要讓制度簡單和可行。

(9)荷蘭有 160 個（全部有 450)小型排放源，總量僅佔參與排放交易制度者全部的 2%。因此，可將此小型排放源排除，以簡化排放交易系統。

3. 議題：拜訪 Corus 鋼鐵公司/ Tata 鋼鐵. IJnuiden

■摘要：

(1)Tata 集團已有 141 年歷史,集團收入是美金 630 億，為印度商人。該集團有鋼鐵、汽車、顧問、茶及其他 24 種不同業別。Tata 鋼鐵在歐洲是以 Corus 為名。在歐洲是首屈一指的鋼鐵生產商,在 2009 年有 5.2 百萬公噸鋼鐵生產量(2008 年有 6.8）

(2)Corus 公司希望全球鋼鐵業有相近的減量目標。

(3)Corus 公司實施的節能減碳方案是提供永續性產品，例如高延展性鋼鐵供汽車使用、太陽能電池、舒適的 Vite 牆板、EMC^2 屋頂板。以及使用永續性製程和永續改善效率等。

八、 2010 年 8 月 4 日

1. 議題：Developing countries in the Global Carbon Market Overview and Development

■摘要：

(1) 此課程係介紹發展中國家於全球碳交易市場

的發展。

(2)碳交易機制是低成本的減量工具，即便發展中國家沒有減量義務，碳交易機制仍可促進該國的科技發展，增加其工作機會及減少溫室氣體排放量，建議搭配其它減量工具，如補貼政策、法規建置及環境稅徵收等，將更具效益。

(3)強調 MRVCE (Monitoring, Reporting, Verification, Compliance, and Enforcement)是建置碳交易機制的優先步驟。正確的量測及可靠的歷史資料將有助於目標的訂定，同時也能建立參與者對碳交易市場的信心。

(4)我國預計於溫減法通過前針對自願性減量試行碳交易機制，規劃初期已含 MRV 原則。

2. 議題：Field Report from a New Member State - Romania: Implementing the EU ETS

■ 講者：Mr. Vlad Trusca

■ 摘要：

(1)此課程主要係分享羅馬尼亞在加入 EU ETS 後所得之經驗及未來發展方向。

(2)羅馬尼亞於 2007 年初始加入歐盟，其溫室氣體減量目標為較 1989 年水準減少 8%。能源部門提供絕大部份的減量來源。

(3)羅馬尼亞實施 EU ETS 所得之經驗為：國家的建置基礎能力極為重要、於排放源取得正確的

排放量資料是困難的、及法制與決策過程必須精簡等。

3. 議題：

◆ Linking emissions trading schemes

◆ Regional Cap-and-Trade Initiatives

■摘要：

(1)主要係介紹如果未來各碳交易市場有可能連結，其所需要考慮的因素為何。另外對未來可能之發展作一概述。

(2)連接 ETS 時須考量：MRV 之方法、各登錄系統的資料轉換、減量目標、交易及遵約標的、涵蓋部門、法規制度、交易期及遵約期限、核配方式、儲存借貸、及處罰方式。另外穩定的政策亦是重要的考量因素。

(3)要能連接不同的 ETS 並不容易，可由地域性的 ETS 結合開始。最有可能實現的方式是從各 ETS 都接受的抵換機制開始 (例如京都機制 CDM)。

(4)單一個全球性的碳市場架構是不太可能出現的，反而會由許多地域性的不同的市場根據共同的碳價格所組成，就好比原油市場一般。因此，我國於規劃排放交易制度時，應評估未來如遇需要與其他 ETS 連結時，機制為何，並為此情況預留操作空間。

九、 2010 年 8 月 5 日

1. 議題：Carbon Market Dynamics: Price Formation, Creating Scarcity, Causes and Solutions for Volatility

■講者：國際知名碳市場資訊分析與顧問公司 Point Carbon 的 Mr. Endre Tvinnereim

■摘要：

(1) 歐盟排放交易第一階段問題點：EUA 在碳市場從 2004 年 12 月的每公噸 9 歐元曾於 2005 年 7 月標高到 30 歐元一個月後隨即掉到 23 元上下，2006 年 3 月又標高至 28 元，甚至漲到 30 元，但 2006 年 6 月隨即掉到 15 歐元，甚至隨後一路下滑至 2007 年 6 月接近零元。價錢下滑的原因是配額量多於排放量。

(2) 歐盟排放交易第二階段問題點：EUA 的核配是基於京都議定書締約方的允許排放量（AAUs），並訂定 NAPs。在此階段中，計算 CER/ERU 花費時間太長，且經歷到經濟蕭條時期，計算 EUAs 也花費較長時間，且預計排放量會因經濟下滑而降低。在此階段的碳價格變動是從 2008 年 1 月的 24 歐元開始，7 月上漲到 31 歐元後開始下滑，至 2009 年 1 月降至 8 歐元後又微幅上升至 15 歐元至今。而其改變的趨勢正好與油的價格變動相符，也和英國天

然氣價格相近，可見碳市場的價格會隨產業的能源成本變動。

(3) 規劃的歐盟排放交易第三階段：預計以中央統一分配並加上更大量的拍賣方式，而排放上限值會逐年遞減，最終目標是削減 20-30%。預計電力與熱能的允許排放量將逐步下降至零，無法達成就得至拍賣市場上取得。

(4) 碳需求端：電力與熱能供應業因需要提供足夠電力，因此需要改變燃料種類並購碳以符合排放量上限，而產業界也需要提升能源密集度。碳供應端則有允許碳排放上限量、拍賣市場、保留給新排放源的碳量、碳市場 CDM/JI 產生的碳額度或其他補助措施。

(5) 估計電力與熱能供應業是排放量大於獲得的免費配額量，石油與天然氣業則相近，而其他產業則排放量稍低於免費配額。因此產業排放量皆可輕易達成上限值，因此對其他碳額度來源，包括 CDM/JI 等的需求量就不高。

(6) 氣候變化的因素會影響碳市場價格，例如第一階段時，2006 年 1 月，因歐洲天氣溫度低，所需能源增加，碳排放量自然也會增加，因此為能符合碳排放量上限值，碳市場需求增加，碳價格也跟著上漲。

(7) 碳價格變動會受到能源商品、氣候和參與者行

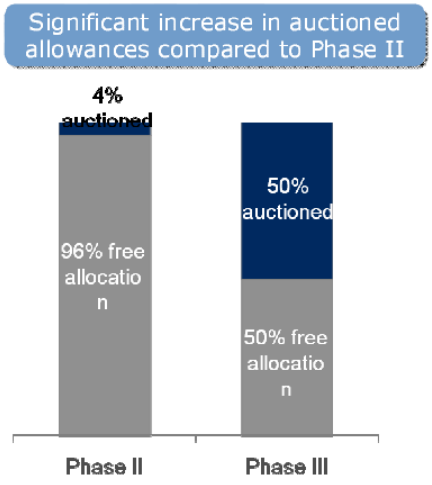
為模式而造成短期影響，但排放量削減要求和減量機會會造成長期影響。

2. 議題：Avoiding Carbon Leakage and Competitive Distortions: ETS Design

■ 講者：為歐盟總部的 Ms. Polona Gregori

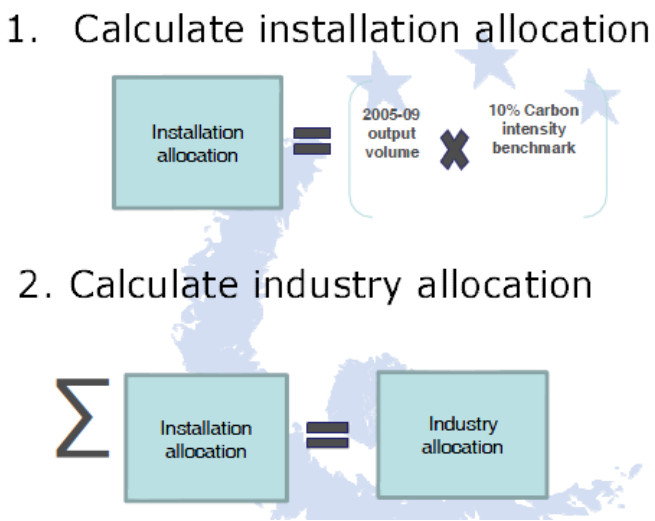
■ 摘要：

(1) 藉由 EUETS 推動產業削減溫室氣體時，在一些資源受限的國家為提升其生產者的競爭力，可能會導致增加全球的溫室氣體排放量，這就是碳洩漏 Carbon leakage。例如第三階段的 ETS 中，有 10 個歐盟國家（主要為東歐國家）的電力部門獲得非馬上需要 100%於拍賣市場取得額度的特例，因此 2013 年可獲得 80%免費配額，再逐年下降至 2020 年僅剩 30%免費配額，預計至 2027 年需全部於拍賣市場購得配額。而非如其他國家電力部門，2013 年需有 30%靠拍賣，2020 年則有 100%靠拍賣。



(2) 藉由評估各部門碳洩漏風險、每五年檢視一次、檢視改變方法者等方式，找出碳洩漏的可能點。例如目前已評估 258 個歸類於 NACE-4 部門（包括採礦與製造廠及相關下游），就有 164 個有碳洩漏風險。

(3) 全歐盟的排放量上限是要在 2020 年時削減至 2005 年的 79%（就是削減 21%），第一階段時是依據查證過的 2005-2007 年排放量資料分配上限值，且逐年削減。分配給產業部門中各排放源的方式，則是以產業部門中前 10%最有效率設備的平均值，這種方式是有考慮到產業的最佳效率技術、替代品...等減量技術可行性。且若配額低於排放量上限值，則歐盟可利用多餘的配額和拍賣等機制，促進創新減量技術發展。



(4) 有關國境邊境貿易產品的碳含量，包括進口，可能會產生的討論議題如下：

- 買配額以涵蓋特定進口商品的相關排放量
- 和相似觀點的夥伴合作，例如美國
- 可能要小心會和 WTO 規則衝突
- 可能會和 UNFCCC 的共同但有區別的減量義務原則衝突
- 可能會擴大歐盟貿易政策的議題
- 增加本地製造商的進口成本
- 增加行政負擔和執行工作（例如定義進口的碳含量）

(5) 歐盟希望和其他國家更密切溝通和降低遵約成本，包括協助國際額度，但限制在第三國產生的 CDM 額度的使用，而非低發發國家的能源密集產業。以及例如要求未努力減量的國家所產生的 CER，要求需要兩倍才能符合減量等方法。

3. 議題：Corporate strategies to manage compliance and hedge market risks

- 講者：為歐州能源供應商 RWE 負責交易工作的 Mr. Sebastian Wurster
- 摘要：產業因應 EUETS 最主要的就是要讓 CO2 排放量要符合被允許的排放量上限值。而準時完成排放量盤查和取得排放許可是重要關鍵，這也

是決定是否有衝突的

十、 2010 年 8 月 6 日

1. 議題：Emission Trading: From Theory to Practice

■ 講者：Mr. Michael Mehling

■ 摘要：

(1) 該主題為 review 所學習的所有課程。

(2) 排放交易制度設計考量下列元件：對象、管制目標設定、彈性機制(分期、儲存、預借)、抵換、核配等。

(3) 歐盟經驗：冗長立法程序及基礎建設、初期因數據品質不良造成超額核配、核配時遭遇遊說、低拍賣比例造成 windfall。

(4) 建議核配直接進入採拍賣方式核配，核配小額數量時建議直接放進碳交易市場可能是較好的機制。

(5) MRVE 須 robust，建議參酌國際經驗。碳洩漏議題被稍嫌誇大，用標竿值免費核配作法應可減少國際競爭壓力。

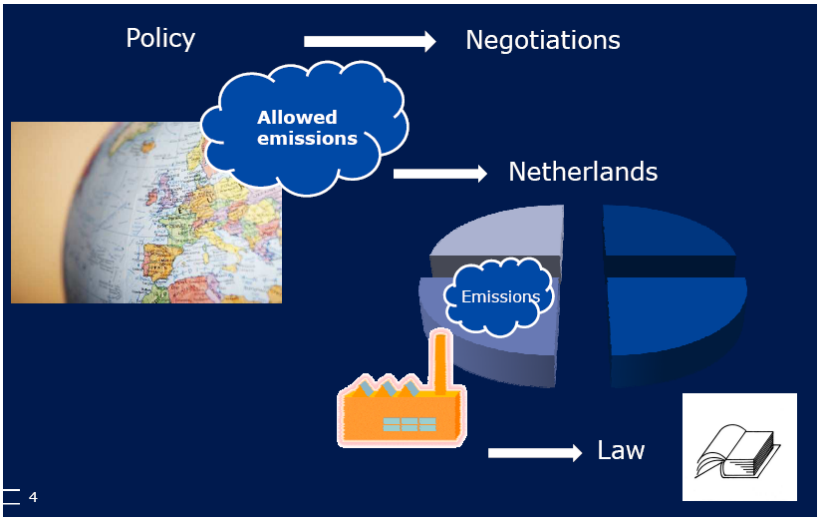
(6) 排放交易的聯結可擴大市場，但須即早規劃與國際相容的機制。

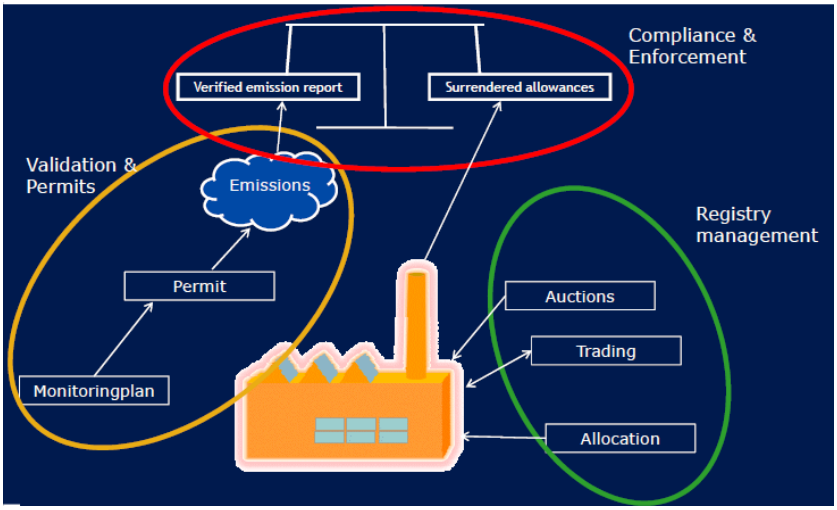
肆、 與會心得及建議

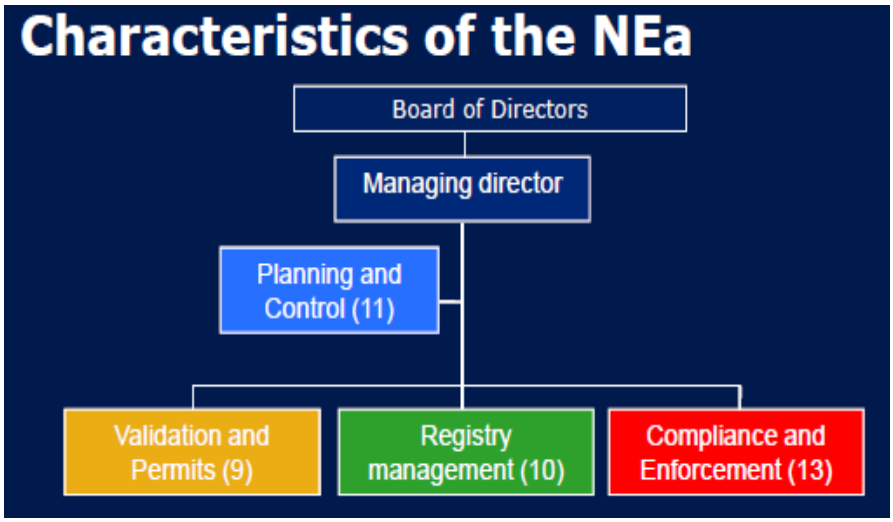
一、荷蘭排放交易平台（the Dutch Emissions Authority）：

荷蘭交易制度(the Dutch Emissions Trading System)係採碳權平台與價格平台分軌管理作法：

(一)三大功能：荷蘭交易平台污染排放權種類有碳及氮氧化物，功能包涵監測計畫確證及許可證核發、遵循及強制執行、登錄及交易(Validation and Permits, Compliance and Enforcement, Registration and Emission Trading)。







(二)開放式交易：荷蘭交易平台是容許個人開戶並且容許 Cancellation (for compensation)，如英國相同，容許非簽署京都議定書之國家及非附件一國家之企業或個人申請該國帳戶。

(三)MRVCE： MRVCE 係除原本量測、報告、及驗證(MRV)外又再加入遵約(Compliance)和執行(Enforcement) ，並且明確規定遵約與違約所會得到之鼓勵及處罰。荷蘭要求產業內部查證、第三方查證、再由主管機關稽核之三段查證之規定，與我國現階段規劃相似，亦即確保碳權價值。具有 MRVCE 五類機制方能確保整個排放交易機制才能夠健全(Robust)及有效率(Efficient)。

(四)分軌式管理：荷蘭排放主管機關(Dutch Emission Authority, NEa)建置之平台，只處理排放量流動，價格平台部分係由金融主管機關負責。此種與價格平台分不同部門之作法，正為我國現階段平台設計構想，即將碳權登錄平台與財政金融部門之價格平台分開管理。

(五)現階段我國係優先推動抵換交易制度，且初期對象以大型需環評抵換之排放源，及自願碳中和之特定對象為主。因此，落實 MRVCE 精神以確保碳權價值為必須把關之處，至於價格平台部份，初期仍以現貨為主，透過金融主管機關協助下，建構保障公平交易的價格平台，以及雙邊自行交易之定型化契約。

二、歐盟處理碳洩漏(Carbon Leakage)之機制[1]

(一)定義：係指先進工業國家為降低本國碳排放量，於是把污染工業設在其他開發中國家，再把所生產之產品運回本國使用，導致全球碳排放總量並未降低，只是生產地有異之狀況。

(二)認定：歐盟交易指令(2003/87/EC)[1]認定部門在遭遇以下任一狀況時，可視為具有碳洩漏之風險：

1.因執行本指令而造成生產成本增加超過 5%，及與歐盟之外國家的貿易密集度(trade intensity，總進出口至歐盟以外國家之和與歐盟市場規模的比率)超過 10%

2.生產成本增加超過 30%；或

3.貿易密集度超過 30%。

(三)補償機制：經認定具有碳洩漏風險者，可得相對於標竿值(Benchmark)之補償排放額度，惟荷蘭鋼鐵業之標竿值為 1.5-1.7 ton CO2/ton steel，較其用公式推導出的 1.6-2.0 ton CO2/ton steel 低。

[1] Directive 2003/87/EC Article 10a,10b

三、國際碳市場發展：邁向雙邊接軌之排放交易

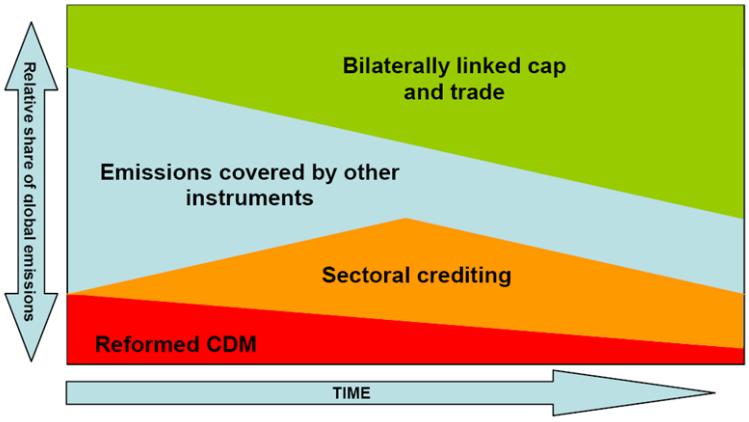
(一)國際碳市場證明係減碳有效率工具之一，為儘量避免碳洩漏情事，除 project-based CDM 必須持續改進外，其他機制，如部門額度(交易)、雙邊連接總量管制等做法，亦已開始討論如何納入現行彈性機制當中。

(二)Reformed CDM，將逐漸萎縮，從最近在中國投資之 CDM 計畫，被聯合國 EB 退了 19 件，且屬水力發電及風力發電之情形，顯示出近年來如中國、印度等國家會逐漸縮減 project-based CDM，將朝向低度開發國家(LDC)。

(三)另預期現行或未來 CDM 產生之減量額度不足抵換，以資金協助開發中國家一整個部門之減量，成為 OECD 國家發展中期國際碳市場的主流機制。

(四)國際間減量機制會逐漸減少 CDM（project based），朝向部門別減量給予額度（Sectoral Crediting）的方式。

(五)連結兩國或區域總量管制及排放交易系統，長期朝向透過雙邊之協議，以降低減量成本的市場機制。



Source: EC, “Stepping up international carbon finance: an European blueprint for Cophenhagen deal” COM (2009) 475/3

四、未來趨勢及可能合作項目

(一)全球一致的碳市場機制，將是符合「成本有效及最低成本」之防制氣候變遷有效措施，不僅能落實環保永續，也能帶動產業新機會，確實是一項很值得我國參考的作法。因此，ICAP 期望能將全球性的碳市場建立連結，積極辦理相關制度培訓會議，並將歐洲經驗提供給開發中國家，我國未來應持續加強與主要國家經驗交流，以完備制度完整性及相容性，以擴大未來國內碳金融市場流通規模。

(二)參與 ICAP 研習營之成員與講師皆為各國負責規劃與執行排放交易之主管機構人員與相關技術幕僚單位，因此主動參與 ICAP 可成為我國建立排放交易制度之主要國際合作管道，更能促進未來我國與國際碳市場連接之可能性。ICAP 仍會持續推動更多組織參與並持續辦理公開論壇，與全球執行 cap and trade 組織持續溝通研討建立全球碳市場所需融合的各項議題，包括 carbon offset 與交易制度，對我國後續建立限量管制與核配交易制度，與協助企業參與全球碳市場是重要的技術專家溝通交流管道，建議本署與研究團隊未來應派員持續參與 ICAP 培訓/年度會議，及邀請 ICAP 專家來台舉辦國際研討會。

(三)荷蘭排放交易專責機構 NEa 是負責執行荷蘭排放源的配額分配與管理機構，但非交易財務管理機構，乃獨立管理荷蘭的溫室氣體排放配額核配、監督、排放

上限達成管理、註銷等工作。本署目前規劃的排放交易平台與清碳聯盟亦朝向此形態進行,未來本署與金管會之分工,可參考荷蘭機制,由本署專責排放交易平台中配額的分配與監督工作,而民間自行實施之碳額度買賣則由金管會協助管理。另,建議未來可邀請該機構專家來台交流建置交易平台的細節。

(四)雖然美國、澳洲、日本都出現氣候立法進度延後,給全球氣候磋商更帶來負面影響。然而,在去年哥本哈根氣候大會期間,北京環境交易所公佈中國首個自願減排之「熊貓標準(Panta Standard)」。代表中國開始爭奪碳產業鏈的制定權,表明中國已認知創建全球碳交易市場的利益關係重要。另,為謀求在國際碳交易體係中應有的話語權,各地紛紛成立環境權益交易機構。同時,依據中國政府發行的英文版 China Daily 報導,中國發改委員會(NDRC)將在第 12 期(2011-2015)五年經建計畫中納入實施試行排放交易制度,碳交易體係雛形初現。過去「中國及美國戰略與經濟對話」主要集中在財經議題,包括貿易保護主義、結構性貿易失衡、智慧財產權、美元地位與人民幣匯率,以及對抗全球金融危機。自從歐巴馬上任後,在「節能減碳」採取了更建設性的態度,使得雙方在環境與能源議題蘊藏了巨大的合作空間。未來的美中政策勢必引導世界走向低碳經濟,共創全球碳交易市場的利益關係,創造高科技的清潔能源體系及綠

色就業機會。中國及美國皆為我主要貿易夥伴國，我國跨國企業應儘早積極爭取參與該區國際碳金融相關綠色產業奠基及接軌，維護全球競爭力。

(五)英國的排放交易制度(UK ETS)可謂全球之首，歐盟的排放交易制度(EU ETS)亦參考英國的經驗，本次ICAP研習會亦邀請英國負責排放交易部門的專家說明拍賣制度。本署將於9月舉辦之NAMAs國際會議亦邀請當初參與英國排放交易制度建置工作的 Mr. Henry Derwen(現任IETA主席)，以及英國摩根史坦利公司的Ms.Xiaohong Jiang (本次ICAP活動講師之一Ms.Olivia Hartridge推薦) 可藉此機會交流碳排放交易、拍賣制度及碳額度管理的MRV經驗。

(六)碳市場機制確為未來溫室氣體減量重要配套措施，並左右所有排放源進行減量行動及擴大綠色產業發展之決策。推動CDM計畫乃是協助企業達成溫室氣體減量工作的初步誘因，協助其以成本有效方式達成減量目標，然未來仍將由部門別總量管制與交易取代CDM計畫型的碳權交易，以達成實質溫室氣體減量的目標。推動我國企業參與國際重要碳議題組織，持續建構參與國際減碳工作之先期能力。藉由推動企業進行溫室氣體減量計畫，以達到政府、企業雙贏的溫室氣體管理方案，讓我國邁向低碳模式與永續發展方向、鼓勵低碳技術發展、企業獲得自願減量信用額度及溫室氣體排放量減緩。同時，為達成我2020年減

量目標，避免我產業失去國際競爭力，尋求充分運用 UNFCCC 所建構的市場機制（markets）以改善減緩行動之成本效益並且予以能力建構機會，以俾利我邁向綠色產業結構及低碳化社會，提供誘因來持續發展低排放量路徑。

伍、 附件

- 附件一、ICAP 簡介

  ICAP flyer

- 附件二、ICAP 碳排放交易夏季研習會議會議手冊

  Background Information for ICAP Summer School 2010

- 附件三、ICAP 碳排放交易夏季研習會議議程

  ICAP Summer School on Emissions Trading for Emerging and Developing Countries. The Hague, 26 July- 6 August 2010

- 附件四、新興開發中國家排放交易制度設計導論

  ICAP Summer School 2010 on emission trading for emerging and developing Countries

- 附件五、ICAP 碳排放交易夏季研習會議簡報資料

  All presentations for ICAP Summer School 2010

About

ICAP is a partnership of countries and regions that are actively pursuing the development of carbon markets through the implementation of mandatory cap and trade systems with absolute caps. ICAP was established in Lisbon, Portugal on 29 October 2007 by Heads of national and regional Governments.

Members

ICAP is made up of 29 different member countries and regions:

(As of September 2009)

EUROPEAN UNION MEMBERS:
Denmark | European Commission | France | Germany | Greece | Ireland | Italy | Netherlands | Portugal | Spain | United Kingdom

REGIONAL GREENHOUSE GAS INITIATIVE (RGGI) MEMBERS:
Maine | Maryland | Massachusetts | New Jersey | New York

WESTERN CLIMATE INITIATIVE (WCI) MEMBERS:
Arizona | British Columbia | California | Manitoba | New Mexico | Ontario | Oregon | Quebec | Washington

OTHER MEMBERS:
Australia | New Zealand | Norway | Tokyo Metropolitan Government

OBSERVERS:
Japan | Ukraine

INTERNATIONAL CARBON ACTION PARTNERSHIP
E-mail: info@icapcarbonaction.com
www.icapcarbonaction.com

INTERNATIONAL

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Carbon Action
PARTNERSHIP

... A WORLDWIDE FORUM FOR PUBLIC AUTHORITIES WITH, OR WHO ARE ACTIVELY PURSUING, CARBON MARKETS THROUGH MANDATORY CAP AND TRADE SYSTEMS ...

... SHARING BEST PRACTICE AND LEARNING FROM EACH OTHER'S EXPERIENCE ...

Structure

ICAP is an open forum of governments and public authorities working on carbon markets through cap and trade systems. While all members and observers meet in person twice a year, the day to day work is carried out by the ICAP Steering Committee, supported by a Project Manager who is based in Berlin, Germany. The Steering Committee holds conference calls on a regular basis. The Project Manager is supervised by the Chair of the ICAP Steering Committee.

Mission

ICAP's mission is to contribute to the establishment of a well-functioning global carbon market by:

- Sharing best practice and learning from each others' experiences.
- Building and strengthening partnerships amongst Governments.
- Ensuring that design compatibility issues are recognized at an early stage.
- Making possible future linking of trading programs.
- Highlighting the key role of cap and trade as an effective climate policy response.

Work

ICAP is a forum to share experiences and knowledge.

ICAP provides assistance to all governments who are interested in establishing cap and trade systems and allows members to share best practice. It is the only multilateral forum to discuss critical issues regarding compatibility and linking of emissions trading systems amongst governments behind closed doors.

For these purposes ICAP regularly organizes public conferences and internal workshops, studies on critical design and linking issues, expert networks as well as outreach and capacity building activities, especially towards emerging economies and developing countries.

ICAP Summer School 2010
July 26 to August 6, 2010 – The Hague, Netherlands

Background Information

List of Participants - ICAP Summer School 2010

	Ms/ Mr	Last Name	First Name	Institution	Position	City of Residence	Nationality	Email
1	Ms	Abdel Motaal	Doaa	World Trade Organization	Counsellor on environmental issues, Cabinet of the Director-General of the World Trade Organization, Mr. Pascal Lamy	Geneva	Egyptian	doaa.abdelmotaal@wto.org
2	Mr	Almeida	Mario Augusto Gouvêa	National Treasury Secretariat	Economic Adviser	Brasilia	Brazilian	mario.g.almeida@fazenda.gov.br
3	Mr	Chen	Bo	CDM Management Center, Energy Research Institute, National Development and Reform Commission	Project Officer	Beijing	Chinese	bchen_energy@hotmail.com
4	Ms	Chien	Hui-Chen	Environmental Protection Administration, Executive Yuan, ROC (Taiwan)	Deputy Director General, Department of Air Quality Protection and Noise Control	Taipei	Taiwan	hcchien@epa.gov.tw
5	Ms	Eun Young	Kim	Korea Environment Corporation	Assistant Manager	Seoul	Korean	ecomania@keco.or.kr
6	Ms	Garavito	Sandra	Ministry of Environment, Housing and Territorial Development of Colombia	CDM Advisor – Climate Change Mitigation Group	Bogota	Colombian	sgaravitor@yahoo.com
7	Mr	Kim	Phanjo	Korea Energy Management Corporation	Assistant Manager	Yongin City	Korean	phanny@kemco.or.kr
8	Ms	Kitvorawat	Nattanan	Thailand Greenhouse Gas management Organization (Public Organization)	Senior Official	Bangkok	Thai	nattanan@tgo.or.th
9	Mr	Kumar	Pradeep	Department of Forests, Environment and Wildlife Management, Government of Sikkim, India	Conservator of Forests	Gangtok	Indian	pradeepifs@hotmail.com
10	Mr	Legote	Mpho Vincent	National Treasury	Economist	Pretoria	South African	Mpho.Legote@treasury.gov.za
11	Ms	Li	Yue	Climate Insights LLC	Partner	Guangzhou	Chinese	yueli@climateinsights.com

	Ms/ Mr	Last Name	First Name	Institution	Position	City of Residence	Nationality	Email
12	Mr	Meng	Xiangming	China Clean Development Mechanism Fund	Project Officer	Beijing	Chinese	mengxiangming@cdmfund.org
13	Ms	Nwamarah	Uzoamaka Uloma	African Development Bank (AfDB)	Climate Change Specialist	Apapa	Nigerian	u.nwamarah@afdb.org
14	Ms	Ock	Wookjin(Jade)	Ministry of Knowledge Economy	Analyst	Gwachun City	Korean	wookjin99@hotmail.com
15	Ms	Okon	Imeh Patience	United States Agency for International Development, Nigeria Mission	Program Manager, Energy and Climate Change	Abuja	Nigerian	graseye@yahoo.com
16	Ms	Qin	Boya	Environmental Certification Center of Ministry of Environmental Protection of China	Project Manager	Beijing	Chinese	boya.qin@gmail.com
17	Ms	Rivera Planter	Marisol	Instituto Nacional de Ecologia	Director of Statistics Analysis and Econometrics Unit	Mexico City	Mexican	mplanter20032003@yahoo.com.mx
18	Ms	Sari	Novita	GTZ	Field Coordinator	Bandung	Indonesian	Novita.sari@gtz.de
19	Mr	Sarkar	Snehashis	Centre for Development Finance, IFMR Research	Researcher	Kolkata	Indian	snehashiss@gmail.com
20	Ms	Schreck	Bettina	United Nations Industrial Development Organisation (UNIDO)	Assistant Industrial Development Officer - Energy and Climate Change	Vienna	Argentine	B.Schreck@unido.org
21	Mr	Soares	Munir Younes	Keyassociados Consulting	General Manager of Climate Change and Carbon Offsets	São Paulo	Brazilian	msoares@keyassociados.com.br
22	Ms	Su xiao	Li	CDM Project Management Centre, ERI,NDRC	Project Officer	Beijing	Chinese	lisuxiao@gmail.com
23	Mr	Tan	Ching Tiong	Southeast Asia Disaster Prevention Research Institute, Universiti Kebangsaan Malaysia (SEADPRI-UKM)	Research Officer	Seremban	Malaysian	tctiong@gmail.com
24	Mr	Valente	Victor Bustani	Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH	Technical Advisor	Rio de Janeiro	Brazilian	victor.valente@gtz.de

	Ms/ Mr	Last Name	First Name	Institution	Position	City of Residence	Nationality	Email
25	Ms	Wang	Ying	China Beijing Environmental Exchange	Senior Manager of R&D Center	Beijing	Chinese	yingwang@cbex.com.cn
26	Mr	Weissman	Gaddy	Foreign Trade Administration Ministry of Industry, Trade and Labor	Deputy Director Trade Linkages Negotiator on Tech Transfer at UNFCCC	Tel Aviv	Israeli	Gaddy.Weissman@moital.gov.il
27	Ms	Yan	Li	National development and reform commission	Official	Beijing	Chinese	li.yan@ccchina.gov.cn

List of Speakers - ICAP Summer School 2010

	Ms/Mr	Last Name	First Name	Institution	Function	Country	Email
1	Ms	Amzour	Nasrine	Department of Energy and Climate Change	Senior policy advisor	UK	nasrine.amzour@decc.gsi.gov.uk
2	Mr	Bakker	Stefan	Energy research Centre of the Netherlands (ECN)	Researcher energy & climate policy	Netherlands	bakker@ecn.nl
3	Mr	Barata	Pedro	Ministry of Environment	Senior policy advisor	Portugal	pedro.barata@clima.pt
4	Mr	Bianco	Nicholas	World Resources Institute	Senior Associate	USA	NBianco@wri.org
5	Ms	Bloemhof	Sascha	Climex	Managing Director	Netherlands	sascha.bloemhoff@climex.com
6	Ms	De Coninck	Heleen	Energy research Centre of the Netherlands (ECN)	Scientific researcher	Netherlands	deconinck@ecn.nl
7	Ms	Duggan	Jill	UK Department of Energy and Climate Change	Senior Policy Official	UK	Jill.duggan@decc.gsi.gov.uk
8	Mr	Görlach	Benjamin	Ecologic Institute, Berlin	Head of Economics and Policy Assessment; Senior Fellow	Germany	Benjamin.Goerlach@ecologic.eu
9	Ms	Gregorin	Polona	European Commission		Belgium	Polona.GREGORIN@ec.europa.eu
10	Mr	Harnisch	Jochen	KFW Development Bank	Coordinator Climate Change Policy	Germany	jochen.harnisch@kfw.de
11	Ms	Hartridge	Olivia	Morgan Stanley	Vice President	USA	Olivia.Hartridge@MorganStanley.com
12	Mr	Hof	Andries	Netherlands Environmental Assessment Agency (PBL)	Climate Economist	Netherlands	Andries.hof@pbl.nl
13	Ms	Jonk	Gerie	Ministry of Environment	Senior policy maker	Netherlands	Gerie.jonk@minvrom.nl

	Ms/Mr	Last Name	First Name	Institution	Function	Country	Email
14	Ms	Kizzier	Kelley	European Commission		Belgium	ann-kelley.kizzier@ec.europa.eu
15	Mr	Mehling	Michael	Ecologic Institute, Washington DC	President	USA	michael.mehling@ecologic-institute.us
16	Ms	Rekers	Joëlle	Ministry of Economic Affairs	Policy Advisor	Netherlands	J.Rekers@minez.nl
17	Mr	Schafhausen	Franzjosef	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety	Deputy Director General "Environment and Energy"	Germany	Franzjosef.Schafhausen@bmu.bund.de
18	Mr	Sijm	Jos	Energy research Centre of the Netherlands (ECN)	Senior scientific researcher	Netherlands	sijm@ecn.nl
19	Mr	Snyder	Jared	New York State Department of Environmental Conservation	Assistant Commissioner, Air Resources, Climate Change and Energy	USA	jjsnyder@gw.dec.state.ny.us
20	Mr	Trusca	Vlad			Romania	vladtrusca@yahoo.com
21	Mr	Tvinnereim	Endre	Point Carbon • Thomson Reuters	Senior Analyst, Trading Analytics and Research	Norway	et@pointcarbon.com
22	Ms	Verhagen	Jessica	Climate Action Secretariat, Province of British Columbia	Director of Business Development	Canada	Jessica.Verhagen@gov.bc.ca
23	Ms	Verschueren	Karin	VROM/NL	Coordinator ETS	Netherlands	
24	Ms	Williams-Jacobse	Julia	Ministry of Housing, Spatial Planning and the Environment	Coordinator ETS	Netherlands	Julia.Williams-Jacobse@minvrom.nl
25	Mr	Wurster	Sebastian	RWE		Netherlands	sebastian.wurster@rwe.com

ICAP Summer School Team 2010

Tobias Hausotter (ICAP)

Tobias Hausotter is the ICAP Assistant Project Manager since September 2008. In this capacity, he has worked on the full range of ICAP activities, including facilitating the work of ICAP members and organizing several ICAP events. Since May 2010, he is heading the ICAP Secretariat in Berlin on an interim basis. Tobias studied International Relations in Dresden and Strasbourg, and holds a Master of Public Policy degree from the Hertie School of Governance in Berlin.

Joëlle Rekers (Dutch Ministry of Economic Affairs)

Joëlle Rekers is a Policy Officer on CO2 emissions trading and international climate policy at the Dutch Ministry of Economic Affairs. After getting her masters degree in Environmental Economics 4 years ago, she joint the Dutch government. In the past few years Joëlle worked on several aspects of the development and improvement of the EU ETS. She is also involved in the international climate negotiations, with an expertise on the market mechanisms.

Renate Elling (Dutch Ministry of Economic Affairs)

Renate Elling is a Policy Officer on renewable energy and climate policy at the Dutch Ministry of Economic Affairs. Renate studied International Relations with a focus on economic issues. After her study she joined the Dutch government; first as an Economic Trainee and since March 2010 as a Policy Officer at the Department of Energy & Sustainability.

Amina El Mellahi (Dutch Ministry of Environment)

Amina El-Mellahi works as a trainee for the Ministry of Environment since september 2009. This program will take two years, in which several assignments withing the Ministry are fulfilled. Before her current assignment at the International Affairs division, she worked at the division which is responsible for the EU ETS in the Netherlands. Now her work is more focused in international climate policy. Her next assignment is not known yet, but will be at a different ministry probably.

Michael A. Mehling (Ecologic)

Michael Mehling is President of the Ecologic Institute in Washington DC, an environmental policy think tank with partner offices in Berlin, Brussels and Vienna. In this capacity, he has led a range of research and advisory projects for government agencies as well as educational and civil society institutions in North America, Europe and the developing world. As an adjunct faculty member at Georgetown University in Washington DC, he teaches graduate students on climate and energy policy. He is the founding editor of the Carbon & Climate Law Review, a quarterly journal on climate regulation and the carbon market, and has authored more than eighty peer-reviewed articles, book chapters and other publications on environmental law and policy.

Bejamin Görlach (Ecologic)

Benjamin Görlach is an environmental economist and Senior Fellow with the Ecologic Institute. The main foci of his work are the evaluation of environmental policy instruments, particularly in economic terms, and the economic valuation of environmental goods and services. Benjamin Görlach was previously with the German Emissions Trading Authority (DEHSt) at the Federal Environment Agency from 2007 until 2008. His work in the economics and statistics sections included evaluations of the European emissions trading scheme and its implementation in Germany, as well as economic analyses to support the further development and refinement of the scheme. He was involved in deriving a benchmark-based system for free allocation of allowances and analyses of the competitiveness effects of emissions trading in Germany ("carbon leakage").

Sören Haffer (Ecologic)

Sören Haffer is Senior Conference Manager and Coordinator, Transatlantic Events at the Ecologic Institute. Within the Institute, he conceptualizes and implements visitors programmes, summer schools and discussion formats with a focus on the transatlantic dimension of environmental policy. Before joining the Ecologic Institute, Sören Haffer worked with the Heinrich Böll Foundation's Warsaw and Washington offices, where he coordinated the Europe Dialogue Program and the Transatlantic Program, respectively.

「第二屆碳排放交易夏季研習會議」課程表

荷蘭海牙，7 月 26 日至 8 月 6 日

〔第一週〕

	7 月 26 日(一)	7 月 27 日(二)	7 月 28 日(三)	7 月 29 日(四)	7 月 30 日(五)
上午	• 課程目標及方法說明 Outline of the Course, Learning Methods and Objectives	• 氣候政策工具:理論及實務 Instrument Choice in Climate Policy: Theory and Practice • 排放交易在政策工作中的機會、挑戰及政策影響 Emissions Trading in the Policy Mix: Opportunities, Challenges and Policy Interactions	• 國際氣候政策及京都機制 International Climate Policy and the Kyoto Flexible Mechanisms • 減量計畫及部門別減量所獲碳權之角色 The Transitory Role of carbon credits at Project and Sectoral Level	• 歐盟排放交易制度之發展 Emissions Trading in the European Union: History, Development and Review of the EU ETS • 澳洲、美國東北州區域溫室氣體減量倡議（RGGI）、西部氣候倡議（WCI）之經驗 Initial Experiences in other ETS: Australia, RGGI, WCI	• 排放交易涵蓋範疇界定 Defining the Scope and Coverage of a Trading System 清冊報告之資料收集方法學 Tools and Methodologies for Data Collection and Inventory Generation
下午	• 由科學角度及經驗面談氣候變遷 Climate Change: An Introduction into the Science and Economics	• 分組討論:排放交易在政策應用之角色 Defining the Role of Emissions Trading in an Optimal Policy Mix • 排放交易制度設計要素 Establishing an Emissions Trading System: Design Elements and Choices	• 現行及新興排放交易設計總回顧 Current and Emerging Emissions Trading Systems: An Overview • 分組討論:核配計畫研訂(一) Group Exercise: Developing an allocation plan (1st Session)	• 碳市場分析及分析工作介紹 Carbon Market Analysis and Analytical Tools	• 核配方法之意涵及經驗原則 Allocating Allowances in an Emissions Trading System: Options, Implications and Experience • 分組討論：核配計畫研訂(一) Group Exercise: Developing an allocation plan (2nd Session)

「第二屆碳排放交易夏季研習會議」課程表

荷蘭海牙，7 月 26 日至 8 月 6 日

〔第二週〕

	8 月 2 日(一)	8 月 3 日(二)	8 月 4 日(三)	8 月 5 日(四)	8 月 6 日(五)
上午	• 碳交易管理架構：碳市場運作功能設計 Administrative Structures for Emissions Trading: Creating Capacity for a Functioning Market	• 荷蘭配合歐盟排放交易之實施情形-困難、經驗及展望 Implementing the EU ETS in the Netherlands-Obstacles, Experiences and Prospects • EU ETS 之拓展-新部門別之整合 Expanding the EU ETS – The Integration of a New Sector	• 開發中國家碳交易發展情形及全球趨勢 Developing Countries in the Global Carbon Market：Overview and Development • 各參與代表經驗分享 Participants' Experiences with ETS in Developing Countries：Presentations & Group Discussion	• 碳市場驅動力：碳價格公式、開創需求、碳市場變動分析及解決方法 Carbon Market Dynamics: Price Formation, Creating Scarcity, Causes and Solutions for Volatility • 避免碳洩露：排放交易制度設計及政策影響 Avoiding Carbon Leakage and Competitive Distortions: ETS Design and the Influence of Politics	• 拍賣：市場分析及能源經濟角色 Carbon Markets in Action: Market Analysis and the Role of Financial and Energy Markets • 分組討論：核配計畫研訂成果報告 Group Exercise：Developing an allocation plan：Presentation of Results
下午	• 排放交易制度運作有效性：MRV 及實施 Ensuring Operation of the Trading Scheme: MRV & Enforcement • 分組討論：核配計畫研訂(三) Group Exercise：Developing an allocation plan (3rd Session)	• Corus Steel 鋼鐵廠址參訪 Visit to Corus Steel Factory/Tata Steel, Ijmuiden	• 實行 EU ETS 經驗：新加入成員為例 Field Report from a New Member State：Implementing the EU ETS • 排放交易制度國際連結：條件及機會 Linking Emissions Trading Systems：Conditions and Opportunities	• 遵約管理及市場風險管理之運作策略 Corporate Strategies to Manage Compliance and Hedge Market Risks • 分組討論：核配計畫研訂(四) Group Exercise：Developing an allocation plan (4th Session)	• 排放交易設計課程回顧:從理論到實務應用 Wrap Up：ETS From Theory to Practice

ICAP Summer School on Emissions Trading for Emerging and Developing Countries

The Hague, 26 July – 6 August 2010

Short Program

Version of 15 July 2010

Week 1

	Monday 26 July	Tuesday 27 July	Wednesday 28 July	Thursday 29 July	Friday 30 July
AM	*Welcome Address* Outline of the Course, Learning Methods and Objectives *(Ecologic Institute)* Interactive Introduction of Participants *(Ecologic Institute)*	Instrument Choice in Climate Policy: Theory and Practice *Benjamin Görlach (Ecologic Institute)* Emissions Trading in the Policy Mix: Opportunities, Challenges and Policy Interactions *Benjamin Görlach (Ecologic Institute)*	International Climate Policy and the Kyoto Flexible Mechanisms *Pedro Barata (Climate Change Commission, Portuguese Government)* The Transitory Role of carbon credits at Project and Sectoral Level *Pedro Barata (CCC, PT)& Gerie Jonk (VROM/NL)*	Emissions Trading in the European Union: History, Development and Review of the EU ETS *Jill Duggan (UK DECC)* Initial Experiences in other ETS: Australia, RGGI, WCI *Nicholas Bianco (WRI), Jessica Verhagen (BC/CAN), NN (Australia)*	Defining the Scope and Coverage of a Trading System *Franzjosef Schafhausen (BMU/DE)* Tools and Methodologies for Data Collection and Inventory Generation *Benjamin Görlach (Ecologic Institute)*
PM	Visit to Ministry in The Hague *On Site Presentation* Climate Change: An Introduction into the Science and Economics *Andries Hof (PBL/NL)* *Cultural Activity and Evening Reception*	*Group Exercise:* Defining the Role of Emissions Trading in an Optimal Policy Mix *Ecologic Institute* Establishing an Emissions Trading System: Design Elements and Choices *Nicholas Bianco (WRI)*	Current and Emerging Emissions Trading Systems: An Overview *Nicholas Bianco (WRI)* *Group Exercise:* Developing an allocation plan (1st Session) *Ecologic*	*Excursion to the Energy Centre of the Netherlands (ECN)* *On Site Presentation* Carbon Market Analysis and Analytical Tools *Various (ECN/NL)*	Allocating Allowances in an Emissions Trading System: Options, Implications and Experience *Jill Duggan (UK DECC)* *Group Exercise:* Developing an allocation plan (2nd Session) *Ecologic Institute*

Week 2

	Monday 2 August	Tuesday 3 August	Wednesday 4 August	Thursday 5 August	Friday 6 August
AM	*Visit to the Dutch Registry with Interactive Simulation* Administrative Structures for Emissions Trading: Creating Capacity for a Functioning Market *Various (Dutch Emissions Authority/NL)*	*Visit to the Ministry for the Environment, Spatial Planning and Housing (VROM)* Implementing the EU ETS in the Netherlands - Obstacles, Experiences and Prospects *Julia Williams-Jacobse (VROM/NL)* Expanding the EU ETS – The Integration of a New Sector *Karin Verschueren (VROM/NL)*	Developing Countries in the Global Carbon Market: Overview and Development *Nasrine Amzour (DECC/UK)* Participants' Experiences with ETS in Developing Countries: Presentations & Group Discussion *(Moderation: Ecologic Institute)*	Carbon Market Dynamics: Price Formation, Creating Scarcity, Causes and Solutions for Volatility *Endre Tvinnereim (Point Carbon)* Avoiding Carbon Leakage and Competitive Distortions: ETS Design and the Influence of Politics *Polona Gregorin (EC)*	Carbon Markets in Action: Market Analysis and the Role of Financial and Energy Markets *Sascha Bloemhof (Climex)* *Group Exercise:* Developing an allocation plan: Presentation of Results *Jury Panel:* *- Julia Williams* *- Kelley Kizzier* *- Michael Mehling*
PM	Ensuring Operation of the Trading Scheme: MRV & Enforcement *Jochen Harnisch (KFW Development Bank)* *Group Exercise:* Developing an allocation plan (3rd Session) *Ecologic Institute*	*Visit to Corus Steel Factory/Tata Steel, Ijmuiden*	Field Report from a New Member State: Implementing the EU ETS *Vlad Trusca (RO)* Linking Emissions Trading Systems: Conditions and Opportunities *Olivia Hartridge, (Morgan Stanley) & Jared Snyder (NYS DEC)*	Corporate Strategies to Manage Compliance and Hedge Market Risks *Representative, Trading Desk, Dutch Covered Utility (Sebastian Wurster,RWE)* *Group Exercise:* Developing an allocation plan (4th Session) *Ecologic*	Wrap Up: ETS From Theory to Practice *Michael Mehling (Ecologic Institute)* *Farewell Ceremony and Certificate Award, including High-Level Address:* The Future of the Carbon Market – Challenges and Opportunities

International Carbon Action Partnership

ICAP Summer School on Emissions Trading for Emerging and Developing Countries

The Hague, 26 July – 6 August 2010

Version of 6 August 2010

Program

Sunday, 25 July, 2009		
	Individual Arrival from Airport (see instructions in the logistics information)	
	Hotel: Parkhotel	Park Hotel, Molenstraat 53, 2513 BJ Den Haag (Tel.: +31 (70) 3624371
	No official program	
Monday, 26 July, 2010		
09:20	Meeting in the lobby and pick-up by Joelle Rekers and Sören Haffer ; Walk to the conference location	Park Hotel, Molenstraat 53, 2513 BJ Den Haag (Tel.: +31 (70) 3624371
10:00-12:30	Welcome and brief outline of the Course, Learning Methods and Objectives ***Michael Mehling, Ecologic Institute, Washington DC, USA***	Rijksacademie van Financien en Economie", Zeestraat 86-90, 2518 AD Den Haag, Tel. + 31 (0)70-3424900
10:45-11:00	Coffee Break	
11:00-12:30	Interactive Introduction of Participants, Q/A ***Ecologic Institute***	
12:30-14:00	Lunch at the Rijksacademie	
13:45–14:30	***Andries Hof, Netherlands Enviromental Assessment Agency)***	
14:30-14:45	Coffee Break	
14:45–15:30	***Andries Hof, Netherlands Enviromental Assessment Agency***	
15:45-16:15	Transfer to the Ministry of Environment **Please bring your PASSPORT with you**	
16:15-18:00	Drinks at "Moorse Tuin", joined by representatives from the Dutch Ministry for the Environment, Spatial Planning and Housing (VROM)	
18:00	Transfer to Restaurant O'Casey's	
18:30-21:00	Dinner @ O'Casey's	

Tuesday, 27 July, 2010	
09:00-10:30	Instrument Choice in Climate Policy: Theory and Practice ***Benjamin Görlach, Ecologic Institute, Berlin, Germany***
10:30-11:00	Coffee
11:00-12:30	Emissions Trading in the Policy Mix: Opportunities, Challenges and Policy Interactions ***Benjamin Görlach, Ecologic Institute, Berlin, Germany***
12:30-14:00	Lunch Break
14:00-15:30	Group Exercise: Defining the Role of Emissions Trading in an Optimal Policy Mix ***Ecologic Institute***
15:30-16:00	Coffee
16:00-17:30	Establishing an Emissions Trading System: Design Elements and Choices ***Nicholas Bianco, World Resources Institute***
Wednesday, 28 July, 2010	
09:00-10:30	International Climate Policy and the Kyoto Flexible Mechanisms ***Pedro Martins Barata, Climate Change Commission, Portuguese Government***
10:30-11:00	Coffee Break
11:00-12:30	The Transitory Role of carbon credits at Project and Sectoral Level ***Pedro Martins Barata, Climate Change Commission, Portuguese Government*** ***Gerie Jonk, Ministry of Housing, Spatial Planning and the Environment (NL)***
12:30-14:00	Lunch Break
14:00-15:30	Current and Emerging Emissions Trading Systems: An Overview ***Nicholas Bianco, World Resources Institute***
15:30-16:00	Coffee Break
15:30-17:00	Group Exercise: Developing an Allocation Plan (First Session) ***Ecologic Institute***
17:30-19:45	Free time for Dinner
20:00	Tram to **Madurodam** For almost 60 years Madurodam has been the smallest city in the Netherlands! Canals, gabled houses and all kinds of other typical Dutch scenes: the miniature city offers you the highlights of the Netherlands on a scale 1:25. Group Picture
22:45	Tram back to the hotel

Thursday, 29 July, 2010		
09:00-10:30	Emissions Trading in the European Union: History, Development and Review of the EU ETS ***Jill Duggan (UK DECC)***	
10:30-10:45	Coffee Break	
10:45-12:15	Initial Experiences in other ETS: New Zealand, RGGI, WCI ***Dave Hoskins, Minstry for the Environment, New Zealand (via Skype)*** ***Nicholas Bianco, World Resources Institute***	
12:15-13:15	Lunch Break	13:15: Bus arrival;
13:30	Transfer with bus coach to the ECN	Bus parks accross the street if possible, otherwise next to the hotel
14:30	Arrival at the Energy Centre of the Netherlands (ECN)	
14:40-15:00	Welcome and introduction on ECN activities ***Heleen de Coninck, Energy research Centre of the Netherlands (ECN)***	
15:00-15:40	ECN activities on EU emissions trading ***Jos Sijm, Energy research Centre of the Netherlands (ECN)***	
15:40-16:00	Coffee	
16:00-16:30	ECN activities on EU emissions trading (continued) ***Jos Sijm, Energy research Centre of the Netherlands (ECN)***	
16:30-17:00	ECN activities on the CDM ***Stefan Bakker, Energy research Centre of the Netherlands (ECN)***	
17:30	Leaving ECN to train station – train ride to Amsterdam	
18:00	Arrival in Amsterdam	
following	Boat-ride and dinner	

Friday, 30 July, 2010	
09:00-10:30	Defining the Scope and Coverage of a Trading System ***Joelle Rekers, Ministry for Economy Affairs, The Netherlands***
10:30-11:00	Coffee Break
11:00-12:30	Tools and Methodologies for Data Collection and Inventory Generation ***Benjamin Görlach, Ecologic Institute, Berlin, Germany***
12:30-14:00	Lunch Break
14:00-15:30	Allocating Allowances in an Emissions Trading Scheme: Options, Implications and Experiences ***Jill Duggan, UK Department of Energy and Climate Change***
15:30-16:00	Coffee Break
16:00-17:30	Group Exercise: Developing an allocation plan (2nd Session) ***Ecologic Institute***

Saturday, 31 July, 2010 and Sunday, 1 August, 2010		
	No official Program. Time to explore The Hague's and Amsterdam's museums, beaches, make tours etc. Please ask the ICAP Summer School Team for suggestions	
Monday, 2 August, 2010		
08:00	Leaving the hotel	
08:30	Tram at Grote Markt	
08:50	Arrive at the NEa	Lizzy Roetmans, Prinses Beatrixlaan 2, 070-3391580
09:00-09:20	Welcome at the Nea and Introductionto the Dutch Emissions Authority ***Harm van de Wetering***	
09:20-09:45	Validation and Permits ***Jaap Bousema***	
09:45-10:15	Compliance and Enforcement ***Bas Bougie and Rudolf van Nuissenburg***	
10:15-10:30	Coffee Break	
10:30-12:30	Registration Emission Trading ***Bas Kroon and Erik van Huis***	
12:30-13:30	Lunch	
13:30	Leave to Rijksacademie	Tram 2 or 6, change to ram 1 at Spui
14:30-16:00	Ensuring Operation of the Trading Scheme: Monitoring, Reporting and Verification ***Jochen Harnisch, Reconstruction Loan Corporation (KfW), Germany***	
16:00-16:30	Coffee Break	
16:30-18:00	Group Exercise: Developing an Allocation Plan (Third Session) ***Ecologic Institute***	
Tuesday, 3 August, 2010		
08:30	Leaving the hotel	
08.50	Arrive at the Ministry for the Environment, Spatial Planning and Housing (VROM)	Oranjebuitensingel 6, Den Haag
09:00-10:30	Expanding the EU ETS – The Integration of a New Sector ***Karin Verschueren, Ministry for the Environment, Spatial Planning and Housing (VROM), The Netherlands***	
10:30-10:45	Coffee Break	

10:45-11:45	Implementing the EU ETS in the Netherlands - Obstacles, Experiences and Prospects **Eva Thompson,** ***Ministry for the Environment, Spatial Planning and Housing (VROM), The Netherlands***	
11:45-12:30	**Lunch Break**	
12:30	Leaving VROM to the bus coach	BAB-VIOS, 0174-315090
12:45	Leave the Hague by bus	Bus will park at Prinsessegracht, next to Art acadamy and Ministry of Treasury
13:45	Arrival at Corus Steel Factory/Tata Steel, Ijmuiden	
14:00-18:00	Tour and Program at Corus	
18:15	Ride back to The Hague	

Wednesday, 4 August, 2010	
09:00-10:30	Developing Countries in the Global Carbon Market: Overview and Development ***Nasrine Amzour, Department of Energy and Climate Change, UK***
10:30-11:00	Coffee Break
11:00-12:30	Participants' Experiences with ETS in Developing Countries: Presentations & Group Discussion ***Moderation: Ecologic Institute***
12:30-14:00	Lunch Break
14:00-15:30	Field Report from a New Member State: Implementing the EU ETS ***Vlad Trusca (RO)***
15:30-16:00	Coffee Break
16:00-17:30	Linking Emissions Trading Systems: Conditions and Opportunities ***Olivia Hartridge, Morgan Stanley & Jared Snyder, NYS DEC***

Thursday, 5 August, 2010	
09:00-10:30	Carbon Market Dynamics: Price Formation, Creating Scarcity, Causes and Solution for Volatility ***Endre Tvinnereim, Point Carbon, Oslo***
10:30-11:00	Coffee Break
11:00-12:30	Avoiding Carbon Leakage and Competitive Distortions: ETS Design and the Influence of Politics ***Polona Gregori, European Commission***
12:30-14:00	Lunch Break
14:00-15:30	Corporate Strategies to Manage Compliance and Hedge Market Risks ***Representative, Trading Desk, Dutch Covered Utility*** ***Sebastian Wurster,RWE***
15:30-16:00	Coffee Break
16:00-17:30	Group Exercise: Developing an Allocation Plan (Fourth Session) ***Ecologic Institute***

Friday, 6 August, 2010		
09:00-10:30	Carbon Markets in Action: Market Analysis and the Role of Financial and Energy Markets ***Sascha Bloemhof, Climex***	
10:30-11:00	Coffee Break	
11:00-12:30	Group Exercise: Developing an allocation plan: Presentation of Results ***Jury Panel: Julia Williams (NDL), Kelley Kizzier (EC), Martin Bergfelder (GER), Benjamin Görlach (Ecologic***	
12:30-13:30	Lunch Break	
13:30-14:15	Wrap Up: ETS From Theory to Practice ***Michael Mehling, Ecologic Institute, Washington DC, USA***	
14:30	Leaving to the Ministry of Economic Affairs **Please bring your PASSPORT and name tag with you**	Bezuidenhoutseweg 30, Den Haag
15:00-15:30	Drinks at the Ministry of Economic Affairs	
15:30-16:00	Farewell Ceremony and Certificate Award, including High-Level Address: The Future of the Carbon Market – Challenges and Opportunities	
16:15	Leave to beach (via hotel if needed)	
17:00-23:00	Farewell BBQ at the beach	Tram 9 from Central Station, or tram 17 from hotel to Central Station and change trams there

Saturday, 8 August, 2009	
	Individual departure by public transportation. Please find suggestions in your folder.

ICAP SUMMER SCHOOL 2010 ON EMISSION TRADING FOR EMERGING AND DEVELOPING COUNTRIES

INTRODUCTORY READER

Table of Contents

MARKET-BASED MECHANISMS FOR CLIMATE POLICY

In recent decades, the rise of new environmental challenges has fuelled growing concern for the efficiency of policy measures, leading to the adoption of new regulatory approaches after decades of mostly theoretical debate.[1] As a result, conventional performance targets, often criticised for belonging to an 'extraordinarily crude, costly, litigious and counterproductive system of technology-based environmental controls',[2] have been joined or supplanted by market incentives, all with an aim to 'improve the command system through better balancing of regulatory costs and benefits, improved risk analysis and management and greater flexibility.'[3]

Emissions trading, or, more aptly, the creation of a market for tradable emission allowances, is representative of this trend. It pursues a strategy of quantity rationing and dates back to earlier studies in environmental economics, notably by John H. Dales.[4] At the core of this approach are allowances conferring the right to discharge a specified quantity of pollutants for a limited duration of time. Unlike economic instruments based on pricing control, such as charges imposed on pollutant emissions,[5] a system of transferable emission allowances requires regulatory authorities to determine either a technological baseline or a ceiling – also known as 'cap' – for overall emissions. Over time, the baseline can be changed to improve environmental performance, while successive cutbacks in the scope or number of allowances can be used to impose a gradually tightening ceiling on the aggregate pollutant burden. Ideally, the baseline or ceiling will reflect a level where marginal abatement costs and marginal environmental benefits meet.

Participants are assigned a number of allowances in an arranged procedure and may sell these or purchase additional allowances at the respective market price, signaling the opportunity costs of pollution as determined by the forces of demand and supply. Following initial allocation, thus, the distribution of allowances is left to market forces. If a participant is able to reduce pollutant discharges at fairly low cost, it will have an incentive to do so and sell the excess allowances to other participants. Those with high abatement costs, in turn, can opt for the acquisition of further allowances and thereby increase their own emissions quota, for instance to accommodate growth in economic activity. In the end, whenever the market price of allowances exceeds the cost of emissions reductions, it should prove beneficial to install better abatement technologies or take other action to lower emissions rather than purchase additional allowances. Accordingly, as prices for allowances rise in response to growing scarcity, the demand for them will gradually decrease.[6]

The central benefit ascribed to a market for emission allowances are lowered abatement costs relative to traditional control mechanisms.[7] By providing an ongoing incentive to reduce emissions, a trading scheme may also encourage competition and the development of more efficient technologies.[8] Despite the flexibility left to participants, the specified baseline or cap affords a greater degree of certainty than other economic instruments in the achievement of a desired environmental objective. That, in turn, can help reduce adjustment costs incurred by frequent changes, which often become necessary in the case of pricing models.[9] As opposed to fees and taxes, moreover, the use of allowances places emissions trading in closer vicinity to conventional permit schemes, lessening the administrative challenges involved in a departure from an established practice.[10] Some authors have, however, drawn attention to more critical aspects, arguing, for instance, that the assignment of a price to pollution creates the impression of a 'right to pollute' and conceals the moral implications of environmentally detrimental behaviour,[11] while also going against the principle that the polluter should pay.[12] What is more, some of the savings offered by emissions trading are applied to-

wards the costs of monitoring and ensuring operation of the trading market, as well as the transaction costs placed on participants. Regardless of the debate on its merits and drawbacks, however, emissions trading has become an established feature of modern environmental policy, and, as such, needs to be adequately studied in its political and economic consequences, and – of equal importance – with a view to its legal ramifications.

The first markets for transferable pollution allowances were located in the United States, where they helped regulate air and water pollution. In 1977, for instance, the Clean Air Act was amended to include an offset system which gave new installations the right to commence operations in certain areas[13] only after the resulting emissions had been offset against a reduction in emissions by other, existing sources.[14] When an installation reduced emissions in a permanent, enforceable and quantifiable manner below the baseline level mandated by law, it qualified for an 'emission reduction credit' which can later be sold to other participants. Central features of modern trading programmes, such as 'bubbles' and 'banking', were also introduced at various stages of this offset system. Several smaller programmes followed at the federal, state, and local levels, including a trading scheme for lead in gasoline. In 1990, another amendment of the Clean Air Act created a market for allowances to emit sulphur dioxide (SO2).[15] This programme, designed to limit acid deposition, was primarily directed at large electricity generating plants. Both initiatives have been considered a success, although trading activity was generally lower than expected and mainly restricted to an internal transfer of allowances within large firms.

The use of transferable emission allowances as a regulatory tool has also grown in attraction as an efficient strategy for the mitigation of climate change. Since greenhouse gases are not toxic in the conventional sense, local concentrations or 'hot spots' at a dangerous level – which might otherwise result from an accumulation of allowances in a particular region – are unlikely to occur. On the international stage, emissions trading has been included in the Kyoto Protocol to the United Nations Framework Convention on Climate Change;[16] it has also been implemented in the European Union, and under consideration in various national jurisdictions. A description of the nature of climate change and the international climate regime developed to address it follows below. Further down, regional and national policy efforts – notably to introduce emissions trading as a climate mitigation tool – will be described.

CLIMATE CHANGE AND THE INTERNATIONAL CLIMATE REGIME

The 'greenhouse effect', describing a process by which the atmosphere warms our planet,[17] is based on the notion that changes in the levels of certain 'greenhouse gases'[18] in the atmosphere can substantially alter global surface temperatures.[19] While variations are inherent to the functioning of our atmosphere and closely related to the natural carbon cycle, both global mean temperatures and atmospheric levels of greenhouse gases have been increasing over the past centuries.[20] Despite remaining uncertainties, this trend has been ascribed – at least in part – to human activities, such as the combustion of fossil fuels, livestock farming, and a loss of vegetated areas due to urbanization and deforestation.[21]

Concern over the possible scope of this greenhouse effect prompted the international community to hold a series of workshops and conferences on the subject.[22] In 1988, a newly established scientific body, the Intergovernmental Panel on Climate Change (IPCC), was mandated with assessing the actual threats posed by climate change.[23] Despite accusations of bias,[24] it has been widely recognized as the most authoritative source of scientific advice on global warming, providing much of the factual background for diplomatic negotiations on an international response. Its latest report on the scientific consensus, published in 2007, predicts potential consequences of such warming, including a rise in sea levels, shifting precipitation

patterns, regional flooding, droughts and water shortages, greater damage from extreme weather conditions, and widespread ecosystem disruption.

Citing the threats posed to society by climate change, calls for concerted international action had already been heard long before the publication of this report. In 1988, for instance, the United Nations General Assembly had declared global warming a 'common concern of mankind,'[25] later paving the way for formal negotiations[26] towards a convention opened for signature during the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992.[27] The United Nations Framework Convention on Climate Change (UNFCCC), which entered into force on 21 March 1994, has since been ratified by 189 states, affording it one of the broadest memberships of any international agreement.[28]

As so often in environmental diplomacy, however, strong participation invariably translated into substantive commitments that – being subject to the condition of unanimous consent[29] – proved everything but stringent.[30] Following a recent pattern found in other multilateral environmental agreements (MEAs),[31] the UNFCCC establishes a sophisticated framework of institutions and procedures, deferring the adoption of more detailed obligations to subsequent protocols or amendments.[32] Rather than calling for quantified emissions reductions, therefore, the UNFCCC declares its 'ultimate objective' to be 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.'[33] As the wording already suggests, the legal bearing of this provision is highly uncertain, inciting suggestions that it might not even be a commitment, but only a declarative statement.[34] Scientific uncertainty and political dissension have, to date, stood in the path of international consensus on a threshold for 'dangerous anthropogenic interference.'[35]

A set of principles guides the achievement of this objective, including, notably, the principle of common, but differentiated responsibilities, the precautionary principle, the right to sustainable development, and the need to protect the climate system for future generations, all while heeding the circumstances of developing countries and the requirements of a 'supportive and open international economic system.'[36] Introducing strong considerations of equity and distributional justice, these principles permeate the climate regime, acknowledging the different contribution of industrialized and developing countries to global warming;[37] they also account for the uneven distribution of its impacts, which are likely to be most severe in developing countries, where poverty, a weak infrastructure, and a degraded natural resource base all lead to high vulnerability and also lessen the capacity for adaptation. Accordingly, the international community agreed to confront climate change on a differentiated basis, assigning different levels of commitment to different states.

All signatories are required to establish national programmes outlining mitigation and adaptation measures, cooperate in research, education and the development of clean technologies, and compile and publish national greenhouse gas inventories.[38] While these general requirements are already subject to differing modalities for developed and developing countries, a number of additional commitments apply solely to the industrialized countries listed in an annex to the convention.[39] These obligations include, notably, the adoption of suitable policies and measures to limit emissions as well as protect and enhance removal by sinks, a duty to provide 'new and additional financial resources' to cover the costs of compliance by developing countries and to assist particularly vulnerable countries, and, most controversially, a quantified – but not legally binding – aim of returning greenhouse gas emissions to 1990 levels by the year 2000.[40]

Another important function of the UNFCCC has already been mentioned earlier, notably the creation of an institutional framework to monitor implementation of its provisions, channel information and cooperation, and promote the negotiation of further commitments. An annual Conference of the Parties (COP) is vested with the authority to review operation of the convention and to 'make, within its mandate, the decisions necessary to promote' its ef-

fective implementation.[41] Recurrent monitoring and administration tasks are carried out by a Secretariat,[42] and more detailed aspects of implementation and scientific and technical advice are addressed by two subsidiary bodies.[43] And finally, a Financial Mechanism, currently operated by the Global Environment Facility (GED), provides financial resources on a grant or concessional basis, including for the transfer of technology.[44]

THE KYOTO PROTOCOL AND ITS FLEXIBILITY MECHANISMS

THE PATH TO KYOTO

Signatories of the UNFCCC convened in Berlin in 1995, for the first session of the Conference of the Parties to adopt a series of decisions elaborating on the foregoing commitments. While this seemed to validate the approach chosen when adopting a framework convention, it also reflected an awareness that the substantive requirements contained therein were not sufficient to address the challenges of climate change. Charged with reviewing the adequacy of commitments entered by developed countries,[45] the Conference of the Parties adopted a decision – later known as the 'Berlin Mandate' – opening a new round of negotiations on 'a protocol or another legal instrument' with the aim of setting quantified emission limitation and reduction objectives (QUELROs).[46] A Ministerial Declaration[47] issued during the second Conference of the Parties one year later in Geneva endorsed a distressing report on the science of global warming,[48] thereby imparting added urgency upon the negotiation process and calling for a binding protocol on emissions reductions within a defined timeline.[49]

Building on this momentum, negotiations continued with the aim of presenting a draft protocol to the third Conference of the Parties, which was to meet in Kyoto in 1997. A highly contentious negotiation process followed, pitting different coalitions of states with ardently held views and countervailing interests against each other.[50] Reconciling the various positions only succeeded after an arduous marathon of consultations and reluctant concessions from each side, setting the tone for future climate summits. The unanimously adopted outcome, the Kyoto Protocol,[51] marked the birth of a sophisticated regime built on quantitative reduction commitments for developed countries, as well as a set of highly innovative market instruments – the 'flexibility mechanisms' – to meet these obligations.[52]

Rather than amending the parent convention, the Kyoto Protocol is a separate instrument under international law, requiring ratification by its signatories to enter into force.[53] A Buenos Aires Plan of Action[54] adopted at the fourth Conference of the Parties in Buenos Aires was meant to finalize the text of the Kyoto Protocol, paving the way for ratification by its signatories. Various setbacks, however, notably during the sixth Conference of the Parties, held at The Hague in 2000, coupled with a rejection of the Kyoto Protocol by the United States in 2001, threatened to derail the multilateral climate process.[55] Despite this diplomatic stalemate, the sixth session of the Conference of the Parties resumed in Bonn in 2001, culminating in the adoption of the Bonn Agreement,[56] a political arrangement on core elements of the Buenos Aires Plan of Action.

With some of the most contentious issues thereby resolved, the seventh Conference of the Parties, meeting in Marrakesh that same year, was in a position to settle remaining technical issues with a set of detailed rules, procedures, and guidelines known as the Marrakesh Accords.[57] Central features of the climate regime had thus been put in place, limiting the next two sessions of the Conference of the Parties, held in New Delhi and Milan, to the deliberation of secondary questions. Still outstanding, however, was a sufficient number of ratifications to prompt the entry into force of the Kyoto Protocol. Given the withdrawal of the United States, only a ratification by Russia would ensure the threshold specified in the Protocol itself was met. After much hesitation and political bargaining rumoured to be conditional on substantial concessions,[58] the Russian government finally submitted its ratification instrument to

the UNFCCC Secretariat on 18 November 2004, securing the entrance into force of the Kyoto Protocol on 16 February 2005.

THE KYOTO PROTOCOL

An ambitious and also highly problematic document, the Kyoto Protocol contains twenty-eight articles and two annexes, and frequently relies on subsequent decisions by the Conference of the Parties for elaboration and specification. Sustaining the differentiation of commitments for industrialized and developing countries, it sets forth a number of substantive requirements for developed countries,[59] including a detailed list of policies and measures (PAMs) these may adopt,[60] and also defines general obligations for all parties to the Protocol.[61] Additional provisions contain a definition of terms used in the protocol,[62] guidance on financial aspects,[63] an assignment of institutional roles to the bodies established under the parent convention, including designation of a supreme body, the 'Conference of the Parties serving as the meeting of the Parties',[64] and rules on compliance procedures and the settlement of disputes.[65] With a view to facilitating compliance with the substantive requirements of the Kyoto Protocol, it also outlines broad and general guidance on a set of market incentives, the flexibility mechanisms.[66] It is rounded off by several provisions relating to its amendment, entry into force, voting, reservations, and withdrawal.[67] The annexes list greenhouse gases and sectors covered by the protocol, as well as quantified emission limitation and reduction commitments for specified industrialized countries.[68]

These legally binding commitments are at the core of the Kyoto Protocol, imposed on the same developed nations – Annex I parties – listed in the parent convention and requiring them to individually or jointly ensure that their anthropogenic greenhouse gas emissions do not exceed the specified amounts 'with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.'[69] In its annexes, the Kyoto Protocol goes on to define absolute limit values for a basket of greenhouse gases, expressed in a percentage of base year emissions, to be met over the first commitment period from 2008 to 2012. Ranging from a reduction of eight percent for the European Union to an increase of ten percent for Iceland, these commitments will be calculated against an historical baseline set at 1990, although countries in transition to a market economy may select an alternative base year.[70] Sequestration from certain land use, land use change and forestry activities (LULUCF) may be counted towards compliance with the mitigation commitments.[71] By 2005, parties were required to 'have made demonstrable progress' in achieving their commitments under the Kyoto Protocol.[72]

THE KYOTO MECHANISMS

Background

Aside from the policies and measures mentioned earlier, parties may choose to meet their mitigation commitments with a set of flexibility mechanisms defined in the Kyoto Protocol. Of these mechanisms, also referred to simply as the 'Kyoto Mechanisms,' international emissions trading (IET) is based on a market for tradable emission allowances, whereas the other two – Joint Implementation (JI) and the Clean Development Mechanism (CDM) – involve credits awarded for mitigation projects.[73] Largely adopted in response to pressure from industrialized powers and against occasional resistance from developing nations,[74] these mechanisms were included in the Kyoto Protocol to allow compliance with mitigation commitments in countries with low marginal abatement costs. Given that atmospheric levels of greenhouse gases will decline regardless of where reductions occur, with dangerous concentrations or 'hot spots' of greenhouse gases – which are not toxic in the conventional sense – virtually ruled

out, the gap between abatement costs in advanced economies and in developing countries[75] can be exploited to lower the overall costs of mitigation measures. By providing an ongoing incentive to reduce emissions, the flexibility mechanisms may also encourage competition and the development of more efficient technologies.[76] Mitigation projects, moreover, can serve as a vehicle for foreign investment, advanced technologies, and employment opportunities.

Their inclusion in the Kyoto Protocol is, thus, representative of a general trend in environmental law, where growing concern for the efficiency of policy measures has resulted in conventional performance targets being increasingly displaced by more flexible and less costly economic incentives.[77] Market mechanisms and the resulting assignment of a price to greenhouse gas emissions have, however, also drawn criticism for creating the impression of a 'right to emit', perpetuating current inequalities and concealing the moral implications of environmentally detrimental behaviour,[78] while also going against the principle that the polluter should pay.[79] Developing countries have repeatedly voiced their – by no means unjustified[80] – concern that industrialised nations would rapidly take the 'low hanging fruit' and leave developing countries with less domestic options for compliance with future mitigation commitments. And from an environmental perspective, the absence of a central enforcement body at the international level invites doubt as to whether all parties will meet the challenges incurred by mechanisms involving sophisticated methodologies and necessitating administrative effort, would prove too taxing for governments and encourage fraudulent transactions.

A contentious point in negotiations, moreover, related to whether use of the flexibility mechanisms should be limited. If industrialised nations were able to achieve all their required emissions reductions abroad, so critics argued, they might have no incentive to undergo domestic climate change mitigation efforts. This difficult issue, known under the heading of 'supplementarity,' split parties into factions. The European Union and its Member States have generally favoured placing a limit on the amount of reductions that may be accomplished abroad to meet national mitigation commitments. The United States, Australia, Japan and others, in turn, have contended that limits to the use of this mechanism would be economically disadvantageous.[81] The latter ultimately prevailed, and the Marrakesh Accords contain no quantitative limits on the use of the flexibility mechanisms to meet commitments. Parties are, however, required to provide information demonstrating that their use of the mechanisms is 'supplemental to domestic action', and domestic policies and measures must constitute 'a significant element' of efforts to meet commitments.[82]

All three flexibility mechanisms involve cooperation between parties to the Kyoto Protocol, and are based on the notion of tradable and, to some extent, bankable carbon units that may be counted towards compliance with mitigation commitments.[83] Use of the flexibility mechanisms is voluntary, but conditional on a sophisticated set of rules and methodologies. To be eligible, states must have, first and foremost, ratified the Kyoto Protocol.[84] Industrialized nations seeking to meet their mitigation commitments are also required to calculate their assigned amounts pursuant to specified accounting modalities;[85] by 1 January 2007, moreover, they must have established a national system for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks,[86] and submitted a report documenting the calculation of assigned amounts and demonstrating their capacity to monitor, track and record transactions and land use, land use change and forestry activities.[87] In order to ensure 'the accurate accounting of the issuance, holding, transfer, acquisition, cancellation and retirement' of carbon units, these parties are also required to establish a national registry – essentially a standardized electronic database registering various types of accounts[88] – and designate an organization serving as its administrator.[89] Annual submission of accurate inventories,[90] finally, is the 'backbone'[91] of the eligibility criteria and subject to a strict threshold of failure specified in a separate decision.[92] Parties failing to meet these criteria to the satisfac-

tion of the secretariat and expert review teams within a sophisticated review process[93] may be subject to several sanctions, including exclusion from the use of the flexibility mechanisms.

International Emissions Trading

International emissions trading, or, more aptly, the creation of a global market for assigned amount units, is based on a strategy of quantity rationing[94] and enables parties to purchase or sell carbon units at the respective market price, signalling the opportunity costs of pollution as determined by the forces of demand and supply. Following initial calculation of assigned amounts, thus, the distribution of carbon units is left to market forces. If a party is able to reduce greenhouse gas emissions at fairly low cost, it will have an incentive to do so and sell the excess units to other parties. Those with high abatement costs, in turn, can opt for the acquisition of further carbon units and thereby increase their own assigned amount, for instance to accommodate growth in economic activity. In the end, whenever the market price of carbon units exceeds the cost of emissions reductions, it should prove beneficial to install better abatement technologies or take other action to lower emissions rather than purchase additional units. Accordingly, as prices for units rise in response to growing scarcity, the demand for them will gradually decrease.[95]

Altogether, the Kyoto Protocol contains few details of the trading scheme, leaving a determination of the 'relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability'[96] to subsequent Conferences of the Parties. Such rules have since been adopted through the Marrakesh Accords,[97] which address various aspects of the trading market, including eligibility, participation, liability, and the controversial issues of 'hot air' and 'supplementarity'. Sellers will be liable for the validity of carbon units, with a 'commitment period reserve' limiting the amount participants may sell to ten per cent of their respective assigned amount.[98] Legal entities will also be allowed to participate, but only after obtaining an authorization from their respective country of origin, and under the responsibility of that state. On the international plane, this trading scheme is clearly the most advanced ever designed at such a scale, affording it high visibility and the function of a paradigm for other domestic and international efforts.

Joint Implementation and the Clean Development Mechanism

A different approach to greenhouse gas mitigation has been taken with the project mechanisms of the Kyoto Protocol, JI and the CDM. Rather than allowing for a mere relocation of assigned units between states, these flexibility mechanisms are based on actual reductions through mitigation projects. The major difference between these two mechanisms relates to the host country of the proposed project.[99] JI applies to projects carried out in countries which have themselves entered binding mitigation commitments, and are thus cooperative ventures between two Annex I countries taking advantage of economies of scale, for instance in Central and Eastern Europe. CDM projects, on the other hand, involve developing nations with no mitigation commitments as host countries, such as China, India, and Brazil. As mentioned earlier, the respective mechanisms also issue different types of credits of different names: credits achieved through JI projects are referred to as emission reduction units (ERUs) and are transferred from the registry of the host country to that of the sponsoring country, whereas emissions reduced through CDM projects incur certified emissions reductions (CERs) accredited to the sponsoring nation. All units are fully fungible and may be sold and purchased on the emissions trading market.[100]

Under both mechanisms, projects must satisfy a test of 'additionality', demonstrating that the emission reductions would not have taken place without the project. The proposed project must result in greater emissions reductions than a 'baseline scenario', as credits can only accrue for reductions beyond business-as-usual.[101] Additionality has been a factor of

contention; in order to warrant the desired environmental effects of a project, the issue of credits has to depend on real, measurable, and lasting climate benefits calculated by comparing the baseline scenario to the forecast emissions with the project. The accuracy of this baseline scenario is contentious, however, as it involves predicting future energy consumption patterns, fuel prices, and energy policies – all of which presupposes highly subjective assumptions.[102] As both the investing party and the host country stand to profit from a designated project, moreover, a strong incentive follows to overstate the actual reductions achieved by any given project. With the CDM, in particular, which involves projects in developing countries without binding commitments of their own,[103] this creates a risk of lenience or even fraud: host countries will seek to improve their attractiveness for investment, perhaps even foregoing the adoption of environmental standards to ensure a more appealing baseline, and sponsoring countries want to maximize their return on investment.

In response to these challenges, the project cycle – consisting of the preparation, application, approval and monitoring of projects – for CDM projects than that is stricter for JI. The institution in charge of evaluation and certification procedures is the Executive Board (EB), an elected body of experts consisting of ten voting members with ten alternates from both Annex I and non-Annex I countries. The EB has the authority to approve proposed assessment methodologies for reduction of greenhouse gases, as these often vary by project. It also accredits organizations serving as Designated Operational Entities (DOE) for the validation and registration of projects, including certification of reductions. The EB also ensures that two per cent of the revenue from proposed projects accrue to a separate fund managed by the Global Environment Facility (GEF), which sponsors least developed countries in their adaptation to the detrimental effects of climate change.[104] This adaptation fund is particularly important, given that countries expected to bear the most severe impacts of global warming are usually not as attractive to potential investors in CDM projects.

The Marrakech Accords lay out the procedure for the development and approval of CDM projects, which can have a lifespan of ten years or three rounds of seven years. Project participants prepare a Project Design Document (PDD),[105] which must be approved by local stakeholders and include a description of the environmental benefits that the project is expected to generate, as well as potential negative impacts. A DOE then reviews this document, providing an opportunity for comments by the public, and may then choose to validate it.[106] If validated, the proposal passes to the Executive Board for formal registration. Unless a participating party or three EB members request a review of the project, its registration becomes final after eight weeks.

Once a project is running, it is monitored by participants, who prepare a report that includes an estimate of CERs generated by the project, and submit it for verification by a new DOE to avoid conflicts of interest Following a detailed review of the project, the operational entity will produce a verification report and certify the emissions reductions actually measured during a specified time period.[107] Unless a participating party or three EB members request a review, the board instructs the CDM Registry Administrator to issue the CERs and distribute them to the project participants.[108] Besides the aforementioned share of proceeds for the adaptation fund, the bodies involved in the project cycle charge fees for their participation. In order not to deter potential investors, small-scale proposals may follow a simplified procedure. This counts for renewable energy projects generating up to fifteen megawatts, or energy saving programs that save up to fifteen gigawatt-hours annually.[109]

Given that JI projects are carried out in Annex I parties with established infrastructures and, to the extent these have already been established, national systems under the Kyoto Protocol, and that ERUs issued for such projects are counted against the assigned amount of the host country, simpler procedures may apply. If the host country fulfils all eligibility requirements described earlier, it may follow the process known as ‘first track’*:* it validates the proposed project independently and manages the transfer of the respective ERUs, subtracting

these from its own assigned amount.[110] If the host country does not have the institutional capacity to assess the requisite emissions information, manage the credit transfers, or compile the reports thereof, the project must be carried out under the 'second track,' in which ERUs are accorded by a Supervisory Committee in a process similar to that of the CDM.[111] The Supervisory Committee is made up of six representatives from both Annex I and non-Annex I countries,[112] and its decisions, like those of the CDM Executive Board, are made by consensus when possible or at least a three fourths majority.

MOVING TOWARDS A POST-2012 REGIME

Following years of diplomatic stagnation, the international climate regime witnessed an impressive comeback in 2005. Not only did the Kyoto Protocol finally enter into force on 16 February 2005, but, in doing so, it also allowed its governing body, the Conference of the Parties serving as the Meeting of the Parties (COP/MOP), to convene for the first time later that year.[113] This summit, which was held in Montreal, Canada, from 28 November to 9 December 2005, resulted in the adoption of a wide range of operational details specifying the application of the Kyoto Protocol, and culminated in a mandate for negotiations on new quantified emission limitation and reduction commitments by its signatories.

The Canadian government, which hosted the climate summit, had placed three 'I's' on its agenda: Implementation, Improvement, and Innovation. Against this thematic backdrop, more than forty decisions were adopted during the conference, marking it as a considerable success in the history of these conferences.[114] One of the highlights in this regard was the adoption of the Marrakesh Accords,[115] which had been forwarded as draft decisions to the first Meeting of the Parties to the Kyoto Protocol. They set out the rules, procedures and modalities for a variety of issues, including sinks, the flexible mechanisms and methodological matters.

With a view to the uncertain future of the climate regime, however, for which the Kyoto Protocol merely frames binding commitments until 2012, parties at Montreal adopted a decision on the 'consideration of commitments for subsequent periods'.[116] Due to outspoken resistance from a number of states, this decision limits itself to establishing an 'open-ended ad hoc working group' charged with elaborating future emission reduction obligations for Annex I Parties to the Protocol. The process is to 'begin without delay' and must 'aim to complete its work as early as possible' so as to ensure a seamless transition from the first to the second commitment period starting in 2013. At the same time, a 'dialogue on long-term cooperative action to address climate change'[117] was launched under the United Nations Framework Convention on Climate Change, taking the form of an 'open and non-binding exchange of views, information and ideas in support of enhanced implementation of the Convention' that 'will not open any negotiations leading to new commitments.'[118] While these decisions represent but a first step in the direction of a future climate policy architecture, they effectively opened a door that had previously proven nearly impossible to unlock. Unfortunately, the second COP/MOP, held in Nairobi, Kenya, in November 2006, did little to pass through that door, with transatlantic power politics and the many pitfalls of North-South diplomatic relations once again blocking any real progress.[119] As time runs out and the urgency of a solution rapidly grows, it remains to be seen whether Parties will be able to move forward on the mandate of Montreal at the next COP/MOP, which will be held in Bali, Indonesia, in December 2007.

In December of 2007, parties to the UNFCCC and its Kyoto Protocol agreed on the Bali Roadmap to negotiate an international climate framework beyond 2012. The success of the Bali Roadmap came amidst a new assessment report by the IPCC stating that anthropogenic activities contributed to drastic climate change and those impacts are already occurring and will worsen. Furthermore, the IPCC stated that affordable solutions to reduce such impacts were currently available.[120] The roadmap is a two part process that will conclude in

December of 2009 for the Copenhagen Climate Change Conference. Notably, the roadmap also involves the United States – the only industrialized country that has not ratified the Kyoto Protocol – as a Party to the UNFCCC, and as an observer without voting rights in under the Kyoto Protocol. A central element of the Bali Roadmap, the Bali Action Plan,[121] includes four main pillars: mitigation, adaptation, technology and finance. The action plan recognizes that cuts in emission caused by human activity should be the main objective of the Convention. Also, it recognizes that efforts by all developed countries should be comparable. For developing countries, the Parties agreed to consider 'nationally appropriate mitigation actions by developing countries in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner.' The shift towards verifiable agreements can be seen as a significant change relative to the situation prior to the Bali Action Plan, where the focus largely rested on commitments for industrialized countries. With negotiations under the Bali Action Plan, Parties established the 'Ad Hoc Working Group on Long-term Cooperative Action under the Convention' (AWG LCA).[122]

In December of 2008, Parties met in Poznan, Poland to discuss the half way mark towards the two part process which was planned to conclude in December of 2009. The meetings were taken in the context of planning towards December 2009. Parties were encouraged to clarify and elaborate issues in various submissions. For example, parties to the Convention were invited to submit their ideas and proposals on the four pillars of the Bali Action Plan by February 6th 2009. Little progress was made in reviewing Article 9 of the Kyoto Protocol due to a deadlock on financing issues. As such, unresolved topics were placed under consideration in an agenda for future sessions. In comparison, the discussion in Poznan was less progressive than the results and measures in Bali. Still, by the time of the mid-year climate discussions in Bonn in June 2009, draft negotiating texts were circulated that reflected the many diverging positions submitted by parties to the UNFCCC and the Kyoto Protocol in the previous months. Although an important starting point, these negotiating drafts still contain mostly 'bracketed text', that is, alternative options on which no agreement has yet been reached. Negotiators faced a challenging task to hammer out a consensus by the end of 2009.

The December of 2009 conference in Copenhagen, Denmark was, unfortunately, not the success Parties had been hoping for since the 2007 conference in Bali. Due to a variety of reasons, the Parties failed to create the expected binding framework for the Kyoto Protocol beyond 2012. Overcrowding among participants,[123] a slow pace, and resistance from several key countries exacerbated the problems already facing the Parties due to unpreparedness by the AWG LCA, who failed to produce cohesive, finalized recommendations for moving forward: what they presented to the Parties was still heavily bracketed and divisive. After little progress and just two days left before the end of the conference, the Danish Prime Minister, (chairing the conference) invited 20 heads of state from the highest emitting countries and the main negotiating groups of the UNFCCC to attempt to put together a document among themselves with hopes that it would be accepted by the Conference on the last day. Unfortunately, the resulting document was not to the satisfaction of many negotiators, and subsequently was not adopted by the Parties.

Instead, the document's existence was only acknowledged as the Copenhagen Accord, a non-binding agreement that is more of a political declaration[124] than the comprehensive plan hoped for since Bali, lacking any strategy or timeline for achieving its vaguely stated goals. In it, countries acknowledge that climate change is taking place and that the average global temperature should be prevented from rising above 2° Celsius, though it does not provide a baseline from which to measure the rise in temperature. The Accord declares that emissions must peak as soon as possible for developed countries and calls for reduction commitments from countries for 2020, yet lacks a minimum reduction that must be made to prevent temperatures to rise above 2°. Developing countries should create Nationally Appropriate Mitiga-

tion Actions (NAMAs) and voluntary actions by least developed countries, which will be carried out with aid from developed countries through an adaptation fund. Countries were asked to make their own commitments to emissions reductions according to what they think is appropriate, again, without a minimum commitment. Additionally, it calls for the immediate creation of a REDD+ scheme and pledges from developed countries to support the program. To fund REDD+, NAMAs and least developed countries plans, an adaptation fund is to be created by Developed countries to provide this aid, by together providing $30 billion annually for the next few years, rising to $100 billion annually by 2020. So far, commitments have only totaled $23 billion.

OTHER FORA FOR DISCUSSIONS ON THE FUTURE CLIMATE CHANGE REGIME

G8 Summit

The Group of Eight (G8) is a forum for governments of eight nations of the northern hemisphere: Canada, France, Germany, Italy, Japan, Russia, the United Kingdom and the United States. The G8 convenes an annual summit where heads of state and their respective government officials convene for a round of discussions on matters of relevance. Previous G8 summits have prioritized the importance of addressing climate change. In 2005, the former UK Prime Minister Tony Blair made climate change one of the main topics for the G8 summit he hosted in Gleneagles. However, in 2006, Russia decided upon discussion energy security and sidelined the discussion of global warming. In 2007, Germany under Chancellor Angela Merkel put climate change in the centre of attention. During that time, the G8 recognized the importance of the findings in the latest IPCC report. In 2008, the Japanese Presidency followed suit, emphasizing a need for improved technology and expressing determination to reach agreement on the goal of reducing global greenhouse gas emissions by at least 50% by 2050 under the United Nations climate negotiations. In July 2009, the G8 – along with other major industrial countries – met in L'Aquila, Italy. During these discussions, the G8 agreed on cutting carbon emissions by 80% by 2050, and limiting global warming to 2°C compared to pre-industrial levels. However, the G8 failed to convince other developing countries to accept targets to cut emissions levels to 50% by 2050. Critics pointed to the lack of interim measures to meet such targets.

Major Economies Forum

The Major Economies Forum on Energy and Climate (MEF) was launched by United States President Barack Obama in March 2009, building on the Major Economies Meetings (MEM) which his predecessor, President George W. Bush, had initiated. Current Secretary of State Hillary Clinton has stated that the MEF is planned to provide 'a vehicle to help us get prepared to be successful' in Copenhagen.[125] The creation of the MEF shows keen interest by the current administration to move towards climate change issues directed at the global level. The fora are geared towards dialogue between developed and developing countries in preparation for a successful outcome at the December UN climate change conference in Copenhagen. Since its inception in March 2009, three preparatory sessions have taken place in the United States, France and Mexico. During the preparatory sessions, climate change mitigation, targets and obstacles have been under discussion. Most recently, during the G8 summit, the MEF also convened its fourth preparatory session. Similar to the outcomes of the G8 summit meetings, developed and developing countries could not come to an agreement on taking legally binding concerted measures towards tackling such measures.

United Nations Secretary General, General Assembly and Security Council

UN Secretary General Ban Ki-Moon has advocated the need for substantial progress towards international climate protection stating that the consequences of inaction will be far greater than the cost of action taken now. Similarly, the Secretary General has frequently stressed the importance of action and to point out the lack of action from world leaders. Before the 2007 Bali conference, Ban Ki-Moon invited leaders to discuss climate change in order to ensure a stronger context preceding the Bali Convention. Similarly, it is expected that Ban Ki-Moon will use an opportunity to invite world leaders in September 2009, before the opening of the General Assembly session, to address the importance of climate change and to address the upcoming climate change deal in Copenhagen.[126]

The General Assembly during its 63rd Session also voiced concerns over the impacts of climate change. Consequently, the General Assembly passed several notable resolutions that solely dealt with climate change and its environmental and security impacts. As such, the General Assembly conferred with the Security Council on matters of adverse effects of climate change and its consequences on security.[127] Similar opinions have been voiced by the Security Council. In April 2007, the Security Council held an open discussion on the possible consequences of climate change for international security. Still, in terms of tangible policy outcomes, these various processes have had a limited impact.

EUROPEAN CLIMATE POLICY AND THE EU EMISSIONS TRADING SCHEME (EU ETS)

CLIMATE POLICY IN EUROPE – PAST AND PRESENT

On 31 May 2002, the European Union assumed a leadership position in the stalling climate process by ratifying the Kyoto Protocol together with its Member States.[128] Within the overall reduction targets set out by the Protocol for its first commitment period, the European Union bound itself to an average reduction of greenhouse gases by eight per cent, distributed among its Member States through an elaborate burden sharing agreement. Using the option to meet commitments jointly under the Kyoto Protocol,[129] the contributions of each Member State were thus differentiated under a European 'bubble' to account for domestic conditions in the respective Member States, such as their expectation for economic growth, their energy mix and the structure of their industrial sector. Although less ambitious than originally intended, reduction obligations for several Member States were still substantially more stringent than the international average, as is evident from the decrease of twenty-eight per cent set for Luxembourg, twenty-one per cent for Germany and Denmark, thirteen per cent for Austria and 12.5 per cent for the United Kingdom.[130] A number of states, in turn, will be allowed to increase their emissions, including Portugal, leading with twenty-seven per cent, Greece, with twenty-five per cent, and Spain, with fifteen per cent. This approach helped the European Union accommodate varying levels of commitment among its Member States while still presenting a common position at international negotiations.

To meet these commitments, the European Union has drawn up a broad strategy in the field of climate change. Already prior to ratification of the Kyoto Protocol, the Commission had proposed a strategy to limit carbon dioxide emissions and improve energy efficiency in 1992,[131] and used its fifth Environment Action Programme to establish climate change as one of seven 'themes' for Community environmental policy, with central objectives and types of action for numerous sectors.[132] A number of legislative acts were adopted in the wake, including measures on energy efficiency and renewable energy sources,[133] energy taxation,[134] funding and promotion schemes,[135] voluntary agreements with industry,[136] and a decision on the

monitoring of greenhouse gas emissions.[137] Responding to the lack of success in achieving greenhouse gas reductions, the Commission published a European Climate Change Programme (ECCP)[138] with the overall objective of identifying and developing 'all those elements of a European Climate Change strategy that are necessary for the implementation of the Kyoto Protocol."[139] To this end, it contains a list of 'proposed Common and Co-ordinated Policies and Measures on Climate Change'[140] for various sectors. It also calls for the establishment of different bodies, including working groups composed of representatives of the Commission, the Member States, and various stakeholders. The sixth Environment Action Programme, which lays down the blueprint of environmental policy for the next decade, has taken up climate change as a priority area of action, identifying short- and long-term strategy objectives and drafting a policy approach with individual actions.[141]

On 9 February 2005, the European Commission adopted a communication setting out the future path of climate policies in the European Union and announcing a second phase of the European Climate Change Programme (ECCP).[142] This document was drafted in response to a request of the European Council at its March 2004 meeting for 'a cost benefit analysis which takes account both of environmental and competitiveness considerations', as preparation for a discussion on 'medium and longer term emission reduction strategies, including targets.'[143] On the basis of an analysis undertaken by the Commission, the communication recommended a number of elements which should be included in future climate change strategies of the European Union and form part of its negotiating position during international consultations on the future of the climate regime. In this regard, it identifies a number of challenges which the Community must face: the 'Climate Challenge', the 'Participation Challenge', the 'Innovation Challenge' and the 'Adaptation Challenge.' The communication is accompanied by a working document setting out in greater detail the scientific evidence and scenarios drawn upon for the communication.[144]

Citing the goal of limiting temperature increases to a maximum of 2°C, the communication specifies a range of proposals designed to structure future negotiations on an international climate regime for the period after 2012, when the first commitment period under the Kyoto Protocol expires. In particular, it emphasizes the importance of including the United States, which rejected the Protocol in 2001, and emerging economies, such as Brazil, India, or China, which are rapidly becoming the main emitters of greenhouse gases, but are not currently bound by any quantified emissions limitation and reduction obligations in accordance with the principle of common but differentiated responsibilities. Accordingly, the communication recommends that the Community strategy aim at broader international participation in reducing emissions, with the European Union continuing to lead multilateral efforts to address climate change, but identifying incentives for other major emitters to take on binding commitments.[145] It also suggest including additional sectors, notably aviation, maritime transport and forestry, which are significantly contributing to rising greenhouse gas concentrations in the atmosphere.

The communication also suggests policies to increase energy efficiency and security of energy supply in the Community, including an increase in research funding, and the development of new climate-friendly technologies. To this end, the Commission recommends a renewed initiative for innovation in the European Union based on 'push' and 'pull' incentives so as to ensure the development and adoption of new climate-friendly technologies and decisions on long-term investments into the energy, transport and building infrastructure.[146] Flexible, market-based instruments such as emissions trading should continue serving the reduction of greenhouse gas emissions. And finally, recognizing the inevitability of a certain degree of global warming, the Commission recommends adopting suitable adaptation policies in the European Union and globally, requiring greater efforts to identify vulnerabilities and to implement measures to increase resilience.[147] With a view to these strategic priorities, the communication recommends accelerated implementation of existing policies that reduce emis-

sions and which foster new technologies, raising public awareness, more focused research, and increased cooperation with third countries.[148] All this should ultimately culminate in a new phase of the European Climate Change Programme[149] with a view to reviewing progress and identifying further options for cost-effective emission reductions.

THE EUROPEAN EMISSIONS TRADING SCHEME (ETS)

One of the measures envisaged by the European Climate Change Programme and the sixth Environment Action Programme was a directive on emissions trading with greenhouse gas allowances. An increased use of economic and fiscal incentives had already been suggested by the Commission at an earlier date, with tradable permits identified as a viable tool requiring additional study.[150] The adoption of the Kyoto Protocol, along with a failure to secure the necessary backing for fiscal incentives in the energy sector, led to renewed interest in emissions trading as a means of lowering greenhouse gas emissions,[151] and prompted the Commission to endorse the creation of an 'internal trading regime' by 2005 as 'invaluable practical experience' for the expected international regime.[152] It also drew attention to the challenges of monitoring and certification, both important for compliance with the trading rules.[153] A further communication, issued one year later, devoted an entire section to emissions trading, recommending a wide consultation with all stakeholders on the basis of a Green Paper and drawing attention to difficulties that may arise from the scope of participation and tensions with existing policy measures.[154] A remarkable shift had taken place: whereas the European Union had notoriously opposed emissions trading in the negotiations for the Kyoto Protocol, the need to achieve greenhouse gas reductions at low cost eventually led it to embrace new mechanisms on the European scale.[155]

After a lengthy process of negotiations with stakeholders on the basis of preparatory documents,[156] the Parliament and Council adopted a directive on emissions trading with greenhouse gas allowances.[157] The main feature of this directive, which entered into force on 25 October 2003,[158] lies in the establishment of a regulatory framework for trade in greenhouse gas allowances,[159] with detailed provisions on the administrative arrangements and procedures. As with most community policies, implementation of the directive has been largely left to the Member States.[160] Accordingly, these are required to ensure adequate operation of the permit procedure and trading scheme, including verification, enforcement, and yearly reports to the Commission.[161] They have also been required to designate competent bodies and maintain the registries accounting for the issuance, possession, transfer and cancellation of allowances.[162] Their most difficult task, however, was arguably the development of National Allocation Plans determining the overall quantity and distribution of allowances. Still, the Commission retained important powers, including designation of the Central Administrator and approval of changes to the scope of participation.[163] More significantly, it is charged with endorsing the National Allocation Plans as well as clarifying and elaborating the allocation criteria.[164] Not surprisingly, implementation of the emissions trading directive has been a demanding challenge for all Member States: in an unprecedented act of the European Union, the emissions trading scheme established an entirely new market for greenhouse gas allowances at very short notice. The following sections will try to illustrate the main elements of the directive as well as some of the main challenges faced by the European Community and its Member States in implementing the trading system.

Scope and Objective

According to its first Article, the directive establishes a scheme for greenhouse gas emission allowance trading within the Community 'in order to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner.'[165] The trading system envi-

sioned by the directive is essentially based on four pillars: national emission allocation plans, a system of individual permits, a mechanism to monitor compliance and impose penalties, and a market for emissions trading between the participating entities. Starting on 1 January 2005, no installation may engage in the activities listed in an annex unless its operator holds a permit issued by a competent authority in the procedure specified by the directive.[166] Covered activities include combustion installations, mineral oil refineries and coke ovens, the production and processing of ferrous metals, the mineral industry, and the production of pulp and paper, with threshold values for most listed activities.[167] Due to the inclusion of combustion plants with a specified thermal input, such as generators, furnaces, or boilers, many sectors which are otherwise excluded from the scope of the directive are required to participate. From the six greenhouse gases mentioned in the Kyoto Protocol, only CO2 has been initially covered.[168] Despite repeated calls for wider coverage during the legislative process, the narrow scope was upheld with a view to simplifying the initial operation of the trading system and the monitoring of compliance. As a result of intense lobbying, however, Member States may decide to include activities below the specified capacity limits and, at a later stage, add entirely new activities, installations and greenhouse gases subject to approval by the Commission.[169] Likewise, Member States may apply for temporary exclusion of certain installations during the first trading period, provided such installations achieve a comparable environmental performance.[170] Installations in the same sector may also form a pool and meet their obligations jointly through a trustee, again subject to Commission approval.[171]

Emissions Permits and Allowances

When applying for a greenhouse gas emissions permit, operators have to submit a description of the installation and its activities, the technology and raw materials used, other emission sources, and measures planned to monitor and report emissions.[172] A permit is granted if the authority is satisfied that the operator is capable of monitoring and reporting emissions. Each permit may cover one or more installations on the same site, and sets out reporting and monitoring requirements, including conditions for the method and frequency of monitoring. Since monitoring and reporting are vital for an effective operation of the trading scheme, the Commission adopted a separate decision with more detailed guidance on 20 January 2004.[173] Changes in the nature or functioning of an installation or the identity of an operator have to be notified to the issuing authority, which will usually update the permit accordingly.[174] Permit conditions and procedures are to be coordinated with permits granted under Directive 96/61/EC[175] concerning Integrated Pollution Prevention and Control (IPPC).[176] An amendment of that directive should further ensure that no emission limit values be included for direct emissions of greenhouse gases, and gives Member States the option to lift any requirements relating to energy efficiency for installations participating in emissions trading. What is more, each permit contains an annual obligation to surrender allowances in an amount covering the emissions reported and verified for the previous calendar year.[177] Allowances constitute the amount of greenhouse gases that an installation is authorized to emit into the atmosphere over a given period of time.[178] They are distributed among participants by way of a national allocation plan (NAP), in which Member States specify the overall quantity of emission allowances and the allocation criteria for each allocation period.[179] The allocation method differs for the first trading period and subsequent periods. For the trial period beginning on 1 January 2005 and ending on 31 December 2007, at least 95 per cent of allowances were to be allocated free of charge. This figure dropped to 90 per cent for the period from 2008 to 2012.[180] Additionally, the allocation plans need to be based on objective and transparent criteria, including those listed in an annex to the directive.[181] Since the wording of these criteria is fairly general, the Commission presented a document with additional guidance for their application on 7 January 2004.[182] These guidelines have been formulated to avoid discrimination and ensure compliance with international reduction targets, although they still

leave considerable discretion to Member States when deciding on the overall burden placed on participants and the rules of allocation.[183] In the end, the
environmental success of emissions trading depends in no small measure on the allocation process.

After their adoption, the plans have to be published and notified to the Commission and all the other Member States. They are then considered within a committee composed of representatives of the Member States and chaired by a representative of the Commission.[184] All in all, this process is governed by an unusually tight schedule: for the initial trial period, the plans had to be published and notified by 31 March 2004.[185] For all later periods, the closing date for publication and notification elapses 18 months before the beginning of the relevant period. Within three months of notification, the Commission may fully or partially reject a plan on the basis that it is incompatible with the criteria listed in the directive.[186] Once approved, however, allocation plans serve as a basis for the allocation to individual operators, which occurs in form of a decision taken by the Member States.[187] For the first period, this decision was due by 30 September 2004; for subsequent periods, the decision has to be taken at least 12 months before the beginning of the relevant period.[188] The actual issue of allowances occurs separately and on an annual basis, with the corresponding share of overall allowances issued by 28 February of each year. Allowances are only valid for emissions during the period for which they are issued, although Member States will have the option, and later a duty, to replace any unused allowances in the following period.[189] By 30 April of each year, operators have to surrender allowances for the preceding year in order to meet the requirement set out in the emissions permit. Such allowances are then subject to cancellation by the Member States and can no longer be used.[190] If an operator fails to surrender a sufficient amount of allowances, a penalty of € 40 (2005-2007) and € 100 (2008-2012) is imposed for each unaccounted ton of CO2 emitted by that operator.[191] Payment of the penalty does not release the operator from the obligation he infringed, providing an additional incentive to reduce emissions or purchase further allowances. In addition, the names of operators who are in breach of their duty to surrender allowances are published by the Member States.[192]

Allowances are hence a central feature of the directive, allowing for control of overall emissions by attaching a tradable certificate to each emitted ton of CO2. As a new category of financial asset, they also represent the starting point of trading markets. Surplus allowances can be sold to other operators within the Community, creating an incentive for emissions reductions below the allocated limit. Participants with high abatement costs, in turn, will choose to purchase additional allowances, thereby lowering the economic burden of compliance. Adequate operation of the market is warranted by the Member States, which ensure that allowances can be transferred and are recognized throughout the Community.[193] Transactions may occur between any natural or legal persons within the Community and, under certain conditions, with persons in third countries.[194] To increase the diversity of compliance options and improve the liquidity of the market, the Commission submitted a proposal for a directive linking emission credits from project activities in third countries with the European trading scheme.[195] The proposed directive establishes conditions for the recognition of emissions reductions achieved through projects eligible under the Kyoto Protocol, thereby promoting technology transfer to industrialized and developing countries.

Registries and Accounts

A functioning market requires accurate accounting of the issue, holding, transfer, and cancellation of allowances. For this purpose, each Member State is under an obligation to establish a registry system in the form of electronic databases, tracking the allowances held by all participants to whom and from whom allowances are issued or transferred.[196] Public access to the accounts in this registry ensure the transparency of the market, although the details of transactions remain private.[197] As an additional safeguard, the European Commission has designated

a Central Administrator to maintain an independent transaction log for the issue, transfer, and cancellation of allowances, identifying irregularities and communicating these to the affected Member States.[198] Additional rules for the establishment and operation of national registries are included in a regulation.[199] As Article 1 specifies, the regulation 'lays down general provisions, functional and technical specifications and operational and maintenance requirements concerning the standardized and secured registries system,' which is made up of registries in the form of standardized electronic databases with common data elements. It also contains details of the independent transaction log of the European Community, and provides for communication with the future transaction log established under the United Nations Framework Convention on Climate Change.[200]

Each Member State and the Commission were required to establish registries in the form of a standardized electronic database by 30 September 2004.[201] As an option, Member States or the Commission may establish, operate and maintain their registry together with one or more other Member States or the Community as 'consolidated registries.'[202] For the purposes of allocation, transfer, and cancellation, allowances are kept in accounts maintained by these registries. Each allowance thus becomes an electronic unit identified by a distinctive serial number. The regulation distinguishes between four different categories of account, namely party accounts for the individual Member States, from which allowances are transferred to the operator holding accounts of participating installations, person holding accounts for other participants, and retirement or cancellation accounts for surrendered allowances.[203] Transactions can occur between any operator or person holding account, and are not subject to a fee.[204]

Emissions Trading and National Allocation 2005-2007

The national allocation of allowances in the emissions trading scheme has been aptly described by the Commission as 'striking a balance between the theoretically desirable and the practically feasible.'[205] It requires each Member State to distribute its allowances according to a convoluted set of rules and recommendations,[206] considering the interests of stakeholders while at the same time ensuring that national reduction commitments for greenhouse gases are met. Allocation is thus at the very core of the trading market, as it determines whether the scheme will result in any substantial greenhouse gas reductions. Member States were required to draft and publish the National Allocation Plans outlining the initial distribution of allowances by 31 March 2004.[207] Only five Member States were able to meet this deadline.[208]

The Commission finalised its review of a first set of plans on 7 July 2004, accepting the plans of Denmark, Ireland, the Netherlands, Slovenia, and Sweden, and partially rejecting the plans of Austria, Germany, and the United Kingdom. A second set of allocation plans was assessed by 20 October 2004, with unconditional approval of the plans submitted by Belgium, Estonia, Latvia, Luxembourg, the Slovak Republic and Portugal, and conditional acceptance of the plans from Finland and France.[209] The plans of Cyprus, Hungary, Lithuania, and Malta were accepted by the end of December, as was the Spanish plan subject to technical changes.[210] By May 2005, almost five months after the onset of the trading scheme, the plans of the Czech Republic, Poland and Italy were approved, finally followed by the Greek plan on 20 June 2005.[211] Altogether, the Commission approved the allocation of 6,57 billion allowances to more than 11.400 installations.

With a view to widely divergent national reduction commitments and the principle of subsidiarity, however, Member States have been left with a substantial degree of freedom to allocate the quantities of allowances they deem necessary. On the domestic level, therefore, allocation had to make provision for national policies in the areas of energy and climate change, the regulatory framework governing economic activity, and individual rights afforded to stakeholders. On the European scale, allocation decisions proved highly sensitive because they affect basic freedoms in the internal market, such as the right of establishment,[212] and

may impinge on fundamental rights, such as the freedom of occupation and property rights.[213] In any case, the allocation process had to ensure equal treatment between participants in emissions trading and other stakeholders, between existing plants and new market entrants, between polluting firms and those that have taken early action in environmental protection.

Allocation may also affect competition and trade concerns, both of which are the heart of the internal market and are thus particularly vulnerable. After all, allocation is essentially a distribution of wealth, exerting a profound impact on the activities it covers. With a view to the possibility of competitive distortions, the allocation criteria set down in the directive rule out discrimination between companies or sectors in a way unduly favouring certain activities, and affirm the applicability of state aid rules to allocation decisions.[214] As the Commission clarified, national allocation plans 'will constitute state aid' and will therefore 'have to be notified to the Commission for assessment under state aid rules.'[215] Different approaches to national allocation may affect competition between covered sectors and the remaining areas of the economy, between the covered sectors themselves, between individual operators in one or more Member States, and between incumbents and new entrants. Accordingly, the directive itself calls for particular attention to the observance of state aid rules.[216] That is a strong affirmation that the allocation to individual operators or sectors may not constitute aid that distorts – or threatens to distort – competition to an extent contrary to the common interest.

It has remained unclear, however, when the allocation of allowances would be considered a violation of state aid rules. While not specifically addressing the allocation of emission allowances, the guidelines on environmental aid compiled by the Commission may provide an indication on situations where state aid may be regarded as 'necessary to ensure environmental protection and sustainable development without having disproportionate effects on competition and economic growth'[217] and therefore compatible with the internal market. Deciding on the national emissions trading scheme introduced earlier by the United Kingdom, for instance, the Commission already considered the free allocation of allowances an advantage that 'distorts competition between companies' and therefore constitutes state aid, but is 'compatible with Article 87 (3) (c) of the EC Treaty' because 'the scheme makes a valuable contribution to the Community environmental policy while not adversely affecting trading conditions to an extent contrary to the common interest.'[218] A similar approach was employed in the assessment of national allocation plans under the directive. As the Commission clarified in a letter issued to the Member States on 17 March 2004, a violation of state aid rules was only likely in the event of excess allocation, an allocation of more than 95 per cent of allowances free of charge, and provision for the banking of allowances.[219]

Political considerations led some Member States to nevertheless favour certain areas of the economy over others, for instance by releasing entire sectors from participation in the trading scheme. Likewise, they have shown a tendency to set lenient reduction goals for certain sectors, and it already appears that they will later be negligent in their enforcement.[220] Unsurprisingly, therefore, the Commission required a number of amendments in the notified allocation plans. With the reasons provided in each decision, the Commission identified those aspects of a plan which violated the allocation criteria, and set out guidance for compliance with the directive. A prime cause of rejection was excessive allocation, assumed whenever the achievement of international reduction commitments appeared uncertain.[221] Of the originally notified plans, several provided for an overly large number of allowances. And while many violations had already been resolved prior to notification following individual consultations with the Commission, in the end, fourteen of the twenty-five plans formally submitted by the Member States were not unconditionally approved as a result of excess allocation, illustrating the willingness of a majority of states to risk violation of the allocation criteria and state aid rules to circumvent their mitigation commitments.[222]

LINKAGES TO INTERNATIONAL TRADING SCHEMES: THE 'LINKING DIRECTIVE'

An international dimension was added to the emissions trading scheme in Europe by way of an amendment directive – known as the 'Linking Directive'[223] – which accommodates the project mechanisms of the Kyoto Protocol, JI and the CDM. Because the legal framework for project mechanisms had not yet been established at the international level when the original directive was drafted, the latter merely included reference to the 'use of credits from project mechanisms' as an issue to consider in the review of its operation,[224] and stated that a link between the project mechanisms and the trading scheme was 'desirable and important to achieve the goals of both reducing global greenhouse gas emissions and increasing the cost-effective functioning of the Community scheme.'[225] It continued by affirming that emission credits from the project mechanisms would be recognized 'subject to provisions adopted by the European Parliament and the Council on a proposal from the Commission,'[226] thereby creating a mandate for the adoption of the Linking Directive.

Accordingly, in July 2003, the Commission submitted a Proposal for a Directive linking these project mechanisms to the emissions trading directive.[227] After the European Parliament approved the Proposal on 20 April 2004 with several amendments regarding the scope and timetable,[228] the Council adopted it at its first reading on 12 September 2004. The swift agreement between Parliament and the Council stands in marked contrast to the legislative process for the original emissions trading directive, which spanned roughly four years, and reflects a sense of urgency among decision makers to lessen the economic impact of emissions trading on European industry. As a result, the Linking Directive entered into force with its publication in the Official Journal on 13 November 2004. Member States had twelve months from that date, or until 13 November 2005, to implement the laws, regulations, and administrative provisions necessary to transpose the Directive into national legislation.

The Linking Directive is expected to provide a greater diversity of compliance options for participants in the emissions trading scheme, better liquidity of the market, and therefore lowered costs.[229] At the same time, the demand for projects in other countries should rise, accelerating the transfer of technology and knowledge to developing and newly industrialized countries. Nevertheless, as with the debate on supplementarity under the Kyoto Protocol, many stakeholders have called for a precedence of domestic action over emissions reductions abroad, pointing to the historically higher emissions levels in industrialized countries and an ensuing moral responsibility.[230] Also, concern has been voiced that the conversion of credits achieved abroad could lessen the environmental benefits of the trading scheme in the European Union, and that the expected decline in market prices for CO_2 allowances might discourage technological advances. Therefore, a central concern during the legislative process was whether to limit the number of credits introduced to the emissions trading scheme, thereby ensuring that reduction projects remain supplemental to domestic action.

With an outright restriction abandoned early in the preparatory stage, the Commission proposal merely imposed a review process whenever the conversion rate reached six per cent of the overall quantity of allocated allowances within the Community.[231] In the final version of the Linking Directive, however, even this review process has been omitted due to concern that potential investors might be discouraged.

In the end, Member States are left with a wide scope of discretion regarding the level of conversion from credits to allowances. Essentially, therefore, the Linking Directive limits itself to establishing how project activities can be applied towards the obligations under the emissions trading scheme, setting out conversion rates and additional procedures. To achieve this, it amends the emissions trading directive by altering current provisions and inserting new substantive articles, notably Articles 11a and 11b. Additional definitions are included to clarify relevant terminology, such as 'project activity', a project approved in accordance with the international rules set out by the Kyoto Protocol and subsequent decisions, and the different

types of reduction units recognized under the emissions trading directive.[232] These include ERUs for JI projects and CERs from CDM projects.

The first substantive provision newly introduced into the emissions trading directive, Article 11(a), establishes the conversion rate for project credits, and outlines various limitations on the fulfilment of reduction obligations through project mechanisms.[233] Under this provision, Member States may allow operators to use credits from project activities up to a certain percentage of the allowances allotted to each installation, a percentage which needs to be specified in the National Allocation Plan starting with the second trading period in 2008. These are then added to the allowances already assigned to that operator under the respective allocation plan. The responsibility for issuing new allowances lies with the Member States.

CERs from projects carried out under the CDM may already be used during the first trading period starting on 1 January 2005, whereas ERUs from JI projects can only be converted from 2008 onward.[234] This early start for the recognition of CERs will likely serve as a crucial impetus for the CDM, greatly increasing interest on the side of both investors and host countries. Conversion of project credits occurs on a one-to-one basis, with each credit held by the operator resulting in the issue and immediate surrender of one allowance in the emissions trading scheme.[235] Exceptions apply for credits generated by nuclear facilities and land use, land-use change, and forestry activities, which are excluded from conversion.[236] While the wording on nuclear projects is less clear, opening the question if certain activities should be permissible in accordance with international rules,[237] land use, land-use change, and forestry projects are categorically excluded due to the difficulties of converting essentially temporary reductions.[238]

Article 1(2) of the Linking Directive, which inserts Article 11(b) into the Emissions Trading Directive, requires Member States to take all necessary measures to ensure that baselines for project activities in accession countries comply with the standards of EC environmental law. Moreover, to prevent double counting of emissions reductions, no CER and ERU credits may be issued for activities within installations already participating in the emissions trading scheme.[239] For a limited period of time, however, project activities which, directly or indirectly, reduce emissions from an installation within the scope of emissions trading can result in credits, provided certain conditions are met.[240] If the reductions occur at the installation itself, an equal number of allowances has to be cancelled by the operator of that installation.[241] If, in turn, the reductions benefiting the installation take place in another Member State, an equal number of allowances has to be cancelled from the national registry of that Member State.[242] Altogether, responsibility for the fulfilment of international commitments remains with the Member States.[243]

Given the attraction of hydroelectric power production for emission reduction projects, an additional requirement has been included in the Linking Directive to limit environmental damage resulting from the construction of large dams. Accordingly, hydroelectric project with a generating capacity exceeding 20 megawatts have to comply with international criteria and guidelines, notably with those elaborated by the World Commission on Dams (WCD).[244]

Finally, the Linking Directive introduces several new procedural requirements, including access to information and reporting. Hence, decisions relating to the allocation of allowances, information on project activities, and emissions reports are to be made available to the public pursuant to existing legislation.[245] A new provision commits Member States and the Commission to support capacity-building measures in developing countries and countries with economies in transition, so as to ensure their sustainable development and the effectiveness of project mechanisms.[246] When reviewing the application of the emissions trading directive,[247] the Commission has to give consideration to the social and environmental impacts of project mechanisms on host countries, the capacity-building measures taken, the approval procedures used by Member States, and a future expansion of the scope of eligible projects.[248] In their national allocation plans, Member States must also indicate their intention to use pro-

ject credits and the percentage to which each installation may acquire and use them. Every two years, moreover, they must indicate the extent to which domestic action contributed to their emissions reductions.[249] Further amendments adapt the wording of the emissions trading directive to the foregoing alterations and newly introduced provisions.

As stated earlier, the Linking Directive marks an important step in promoting the Kyoto Protocol and its project mechanisms. Prior to the adoption of the Directive, interest in the project mechanisms was low, particularly among potential investors. By combining an absolute cap on emissions with the possibility to use credits from the project mechanisms, however, the Linking Directive will provide a strong incentive for participants in the emissions trading scheme to embrace this opportunity for reduced compliance cost.[250] Nevertheless, the criticism launched against the Emissions Trading Directive by environmental protection groups, in particular, cannot be entirely dismissed. Indeed, with no quantitative limit defined for the recognition of project credits, the absolute cap established by the emissions trading system can be compromised by the introduction of an overly large number of reduction units from foreign projects. To some extent, moreover, a lowered price for emission allowances in the trading market will inevitably undermine the ability of the emissions trading scheme to affect human behaviour, and thus also its environmental effectiveness. And finally, reduction projects abroad can only be as effective as similar action at home if the rules for the CDM and JI really ensure a genuine and lasting cut in emissions beyond a baseline scenario, something many observers doubt. Still, by reducing the economic burden on participants, it can help foster greater acceptance of European climate policy. And what is more, with its expanded geographical scope encompassing climate action beyond the political borders of the European Community, the Linking Directive might help create improved negotiating conditions for the further development of international climate change arrangements.

CLIMATE POLICY IN THE UNITED STATES

The United States has been a party actively engaged in the climate negotiations ever since creation of the UNFCCC in 1992. With the rejection of the Kyoto Protocol in 2001, however, the United States – which originally proposed many key elements of the Protocol – the federal administration of President George W. Bush relied mostly on voluntary policies and technology-focused initiatives to address climate change. Mandatory greenhouse gas mitigation policies were therefore pursued at the level of individual states or regions within the US, where several emissions trading systems have been implemented or proposed. Under the new administration and democratic majority in Congress, the prospects for adoption of mandatory market-based policies at the federal level have improved again. The following sections describe recent efforts to adopt relevant climate legislation at the federal level, and also detail state and regional plans toward emissions reductions.

FEDERAL LEVEL

Popular support for governmental regulation of greenhouse gas emissions has fluctuated considerably in the United States in recent years, along with American beliefs about the causes and seriousness of climate change. A downward trend is occurring in the number of people who believe that global warming is anthropogenic and who see it as a serious issue. At the time of writing, the most recent poll of United States citizens concerning attitudes toward climate change revealed that 57% of Americans believe global temperatures are rising only 37% believe it is due to human activities.[251] Only 39% of Americans support the creation of a major energy bill and 40% oppose it,[252] down from a strong majority expressing ‘support for legislation to require the reduction of greenhouse gases’ just three years ago.[253] This trend

added to domestic concerns about the economy, both of which have overshadowed the climate debate in Congress. The fact that 42% believe the government cannot reduce the impacts of climate change, 40% of Americans fear that a climate bill would hurt the economy and 56% of those polled would not be willing to pay more in additional taxes as part of a climate bill make the passage of a climate bill difficult to attain.

The division is reflected in the rocky history of attempts at creating US climate legislation. Several legislative proposals have been made concerning binding reduction targets, the most symbolic of which effectively 'overrode' the infamous Byrd-Hagel Resolution of 1997.[254] In July 2005, a new Senate Resolution called for Congress to:

> enact a comprehensive and effective national program of mandatory, market-based limits and incentives on emissions of greenhouse gases that slow, stop, and reverse the growth of such emissions at a rate and in a manner that:
> (1) will not significantly harm the United States economy; and
> (2) will encourage comparable action by other nations that are major trading partners and key contributors to global emissions.[255]

Passage of that resolution followed the defeat of the so-called Climate Stewardship Act, a proposal for an emissions cap-and-trade system by senators John McCain and Joe Lieberman. The plan, backed by many environmental groups, would have used greenhouse gas emissions levels in 2000 as a target for 2010, setting up a scheme for emissions credits; the credits would have been traded among emitters with no cost limits. This effort failed by a vote of 60-38, but occurred during consideration of the much-debated Energy Policy Act that had been stalled so long it could not be drawn out.

A number of legislative proposals were considered in both houses of Congress thereafter, although none garnered sufficient support to ensure passage by the legislative body. Momentum for climate legislation improved with the federal elections in November 2008, which extended the democratic majorities in the Senate and the House of Representatives, and also saw a democratic candidate ascend to the office of the Presidency. President Barack Obama had already campaigned on a platform that identified energy and climate policy as central priorities, and highlighted the economic benefits of alternative energy technologies as well as the importance of energy independence.

American Clean Energy and Security Act (ACES)

In June 2009, the House passed the American Clean Energy and Security Act (ACES) by a vote of 219 to 212. The bill is the first to define mandatory near-, medium, and long-term reduction targets for greenhouse gases, and to provide for an emissions trading system as the central policy for achievement of emissions reductions. As such, the bill establishes caps that would regulate overall GHG emissions to 3% below 2005 levels by 2012, 17% below 2005 levels by 2020, and 83% below 2005 levels in 2050.[256]

The proposed bill would introduce requirements for renewable energy for utilities, incentives for carbon sequestration, and funding for studies on relevant issues of energy and the environment. Energy efficiency incentives are given for buildings and homes and provisions in the bill allow for an expansion of green job opportunities. In the initial years, 15% of the allowances are auctioned through ACES. This percentage is set to increase till 70 % by 2030. Due to concerns over rising prices for utilities, consumers will are protected of rising costs and lower income families are eligible for refundable cash credit. Emission allowances are provided for large industries that are energy intensive, oil refineries and merchant coal generators away from carbon based fuels. The overall value generated from the allowances would be largely geared towards protection of consumer from rising prices and support for technologic advancement. The allowance values generated would be allocated towards states to in-

stitute State Energy and Environmental Development (SEED) that is geared towards promotion of energy efficiency and renewable energy programs. Besides the allowance allocation towards SEED, provisions are planned for advancing vehicle technology, emissions reduction through prevention of deforestation in developing countries and emissions reduction from agriculture and forestry related sources in the United States.

According to the bill, carbon market oversight would be carried out by the Federal Regulatory Commission. In terms of offsets, 2 billion tons of emission credits can be acquired. Of the 2 billion tons, half must stem from domestic offsetting and the other from international sources. Under certain circumstances, up to 1.5 billion tons can be acquired from international projects. Cost containment measures include unlimited banking, two year compliance period which would allow borrowing a year in advance. The bill also allows for states to impose tougher regulations with the exception of the cap-and-trade program. Similarly, in recognition of prior state activity holders of allowances issued by California, the Western Climate Initiative (WCI) or the Regional Greenhouse Gas Initiative (RGGI) can exchange these state allowances for federal allowances. However, state trading programs would have to be put on hold from 2012 to 2017 for the federal system to get started.

American Power Act (APA)

After several months of closed door tri-partisan negotiations, a month-long delay in its release and the loss of a Republican sponsor, the Senate's long awaited counterpart bill to the Waxman-Markey ACES bill was finally released by Senators John Kerry and Joseph Lieberman on 12 May 2010. Unlike previous Congressional bills addressing climate change, the American Power Act is designed with industry in mind and through negotiations with leaders from large emitting industries, including such major industries as oil, mining and the utilities sector, as well as special interest groups from retired military officials to environmentalists. The resulting bill has aspects meant to appeal to a wide range of Americans, from environmentalists to industrialists. It sets national goals for emission reductions leading to 2050 and creates a national emissions trading scheme, with different rules for different industries.

The emissions reduction goals are in-line with President Obama's goal of 17% reductions of 2005 levels by 2020, then 42% by 2030 and 83% by 2050. The regulations on industrial emissions are very favourable for industry, designed to ease industry into the trading system in order to address concerns by many Americans that any attempt to regulate greenhouse gas emissions would harm the economy. To achieve this, emission caps will be set for different sectors; to address industry concerns about the disparity of emissions inherent to some industries. The power producers would be the first to come under regulations, manufacturers would not face restrictions for an additional six years, and local distributors of electric and natural gas utilities will receive free allowances through 2029. To win over consumers, approximately one-third of revenue from the sale of allowances will be returned to consumers as rebates, the other two-thirds would go to deficit reduction. The price of allowances will be highly regulated, with a cap of $25 dollars, adjusted for inflation.

Some aspects meant to appeal to industry almost go too far for some environmentalists, as several elements of the bill represent a step backwards in environmental policy. The bill would pre-empt regulations already in place at the state and local government level, including the young but increasingly successful Regional Greenhouse Gas Initiative in the North-East as well as any state laws pushing for more aggressive reductions. It additionally confirms Obama's plan to open new areas of the Atlantic Ocean to offshore drilling, though aspects of this are being tweaked as a result of BP's *Horizon* oil rig disaster in the Gulf of Mexico. With mixed appeal to both industry and environmentalists, the American Power Act faces an uphill battle to passage, though it is still possible that it may pass before the end of the legislative period and the mid-term elections in November 2010.

ADMINISTRATION

U.S. government reluctance to regulate greenhouse gases on the federal level during the previous administration sparked a string of judicial proceedings. State governments, in cooperation with environmental groups, initiated lawsuits against power companies regarding carbon emissions, and against federal agencies for neglecting to regulate these emissions. Largely a symbolic act, such cases were meant to draw attention to the federal government's neglect of environmental issue. One such case, which came before the Washington, D.C. Circuit Court requested the Federal Environmental Protection Agency (EPA) to regulate greenhouse gas emissions from new motor vehicles and engines under the Clean Air Act,[257] argued greenhouse gases are air pollutants that significantly contribute to global climate change.[258] Although it was denied in 2003,[259] the case has been petitioned for review several times. In 2005 the case was introduced as *Massachusetts v. EPA*,[260] in which the three-judge panel was staunchly divided and issued three separate opinions. The petition was denied and the Petitioners appealed.[261] In 2006, the case went to the Supreme Court, the court's first pronouncement on climate change. By a vote of 5-4, the Court held that: (1) Massachusetts had standing to sue, (2) Section 202 of the Clean Air Act authorizes EPA to regulate emissions from new motor vehicles on the basis of their possible climate change impacts, and (3) Section 202 does *not* authorize the EPA to inject policy considerations into its decision whether to so regulate. Section 202 (a) (1) of the Clean Air Act states:

> The [EPA] Administrator shall by regulation prescribe (and from time to time revise) in accordance with the provisions of this section, standards applicable to the emissions of any air pollutant from any class or classes of new motor vehicles or new motor engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare…[262]

The Supreme Court's decision led the EPA to adopt an endangerment finding, but also drew attention to the fact that the authority for such sweeping regulatory power should lie 'in the halls of Congress, not a federal courthouse.'[263] Thus, pressure is all the more strongly directed toward Congress to enact binding emissions reduction targets for the United States. However, the current administration has indicated plans to regulate emissions through executive powers of the EPA if the legislative branch fails to act. In response, the EPA has proposed a national system for reporting emissions of GHGs under the authority of the Clean Air Act. The new reporting requirements would apply to suppliers of fossil fuel and industrial chemicals, manufacturers of motor vehicles and engines, as well as large direct emitters of greenhouse gases with emissions equal to or greater than a threshold of 750,000 metric tons per year. The direct emission sources covered under the reporting requirement would include energy intensive sectors such as cement production, iron and steel production, electricity generation. In April of 2010, the EPA's plan for regulating greenhouse gases under the endangerment finding has been sent to the White House for review.

VOLUNTARY INITIATIVES

Despite the lack of federal climate legislation, a recognisable progression towards national emissions reduction targets is occurring across the country. American businesses – particularly the energy sector – are acutely aware of foreign and international climate change mitigation policies. At the business level, a voluntary market has established itself in the form of the Chicago Climate Exchange (CCX), an emissions trading program that was sold to the Intercontinental Exchange, who also owns the company that operates the European Climate Exchange, in May 2010. The self-regulated exchange is designed and governed by its members, who make legally binding commitments to reduce their emissions by predetermined amounts

according to a baseline and thus expect to have an advantage over their competitors when such commitments become mandatory. Competitive advantages arising therefrom are also seen as furthering the position of United States business in global markets.

INITIATIVES AT THE STATE LEVEL

These federal efforts have been preceded by an active drive toward binding reduction targets on the state and regional level in the U.S. during the previous administration. Comprehensive state plans to set targets for emissions reductions have been adopted by several states. Each has a different target and method of categorising emissions, which is frustrating for energy suppliers that span different states and therefore have to comply with differing reduction goals and regulations. New Jersey was one of the earliest states to take action on climate change when in 1998 it announced plans to reduce greenhouse gas emissions to 3.5 percent below 1990 levels by 2005. In October of that year the state government classified carbon dioxide as an air contaminant. In California, Governor Arnold Schwarzenegger signed an executive order in June 2005, setting greenhouse gas emissions targets requiring California to reduce to 2000 emissions levels by 2010, 1990 levels by 2020, and eighty percent below 1990 by 2050. As a result, California passed the California Global Warming Solution Act of 2006 (AB 32). The comprehensive state-wide act requires that California's GHG emissions be reduced to 1990 levels by 2020, reflecting a roughly 25% reduction under business as usual estimates. The California Air Resources Board, under the California Environmental Protection Agency, is to prepare plans to achieve the objectives stated in the Act, and has been mandated with developing a market-based reduction program.

Apart from all of these individual efforts, nine north-eastern states have launched a regional emissions trading system somewhat resembling the European emissions trading scheme: the Regional Greenhouse Gas Initiative (RGGI) aims to reduce the collective CO_2 emissions of the northeast United States by establishing a cap for participating states and allowing trading of emissions credits among their power producers. On 20 December 2005, seven of the states that had been developing the scheme signed a Memorandum of Understanding (MOU) committing them to translate its provisions into their respective state energy laws. The MOU mandates that these states will stabilize CO_2 from the region's power plants at current levels in the period from 2009 to the start of 2015, followed by a ten per cent reduction by 2019. The program is implemented through state regulations, based on a RGGI Model Rule, which are linked through allowance reciprocity. Regulated power plants can use a CO2 allowance issued by any of the ten participating states to demonstrate compliance with the state program governing their facility. Taken together, the ten individual state programs function as a single regional compliance market for carbon emissions. In late 2008, the first auctions of RGGI allowances were held, with prices per allowance in the range of $3.

Similar to the efforts carried out by RGGI, the Midwestern Greenhouse Gas Reduction Accord and the Western Climate Initiative (WCI) are regional initiatives that have been launched in the absence of federal climate regulation. The Midwestern Greenhouse Gas Reduction Accord is a regional agreement signed in November 2007 by six Midwestern state governors and the Premier of one Canadian province to reduce greenhouse gas emissions to combat climate change. At the time of writing, the governors are reviewing the recommendations from the Midwestern Greenhouse Gas Reduction Accord Advisory Group, who will provide their input for the next steps of the Accord.[264] Similarly, WCI partners includes six Western states (the states of Utah and Arizona removed themselves from the Initiative, Washington and Montana have announced they will not be ready to take part, but are still part of the Initiative) and four Canadian provinces. On August, 2007, the WCI set a goal of reducing greenhouse gas emissions by 15% from 2005 levels by 2020.

CLIMATE POLICY IN THE ASIA-PACIFIC REGION: AUSTRALIA, NEW ZEALAND AND JAPAN

Australia has the highest per capita greenhouse gas emissions in the world, and to address this, the Australian government has set a goal of lowering emissions up to 25% from 2000 levels by 2020, to be achieved through a variety of programs and initiatives. The Carbon Pollution Reduction Scheme is a proposed cap-and-trade market on carbon emissions that has been finalized, but has yet to be implemented. On 27 April 2010, the Australian Prime Minister announced that the scheme's introduction would be delayed until after the first commitment period of the Kyoto Protocol ends and there is more clarity on what commitments major economies, such as the United States, China and India would be making. Additionally, the Australian government has created numerous programs that promote clean technology and encourage energy efficiency among citizens. The state has already invested $5 billion in clean technology development and its commercialization and is planning an additional $4.5 billion for finding new ways to use national natural resources to create cleaner energy and new jobs. There are numerous programs to promote energy efficiency in different sectors of the economy, such as efficiency in buildings, manufacturing processes, rebates to homeowners who make costly improvements and $1.3 billion for research and development in more efficient cars. They also are educating businesses and workers in efficiency and sustainability.

On 1 July 2010, New Zealand began implementing its own emissions trading system. Originally conceived in 2008, several amendments have been made since its creation. All sectors of the economy are affected by the system, from the miners who supply coal that will be burned, to the manufacturers consuming the energy, to the physical sources of emissions. During the first period (2010-2012), emissions are priced at a fixed cost of NZ$25 per tonne CO_2. Additional credits are given to forest landowners whose forests were planted before 1990, which are either traded to other polluters or surrendered as forests are harvested. After just one week in practice, New Zealanders are already reporting higher electricity, oil and airfare costs. Environmentalists say the scheme will not do nearly enough to reduce emissions and are calling for its suspension in favour of a carbon tax.

Japan is the world's fifth largest carbon emitter in absolute terms. Japan has set a goal of reducing its greenhouse gas emissions by 25% from 1990 levels by 2020, and so far has largely relied on voluntary commitments from industries and corporations to reduce emissions without legislation. However, Environment Minister Ichiro Kamoshita announced that if the country is in danger of not meeting its Kyoto goals, it will take stricter actions to reduce emissions, such as introducing a carbon tax. The Japanese government hopes to have a comprehensive climate bill in place by November 2010 as a way of documenting climate action prior to COP-16 in Mexico. The envisioned bill will have three main goals: establishing a domestic emissions trading system, introducing environmental taxes, and expanding the feed-in tariff program to promote renewable energy source. It plans to be in line with the goal of 25% reductions in emissions from 1990 by 2020, and aims to ensure that 10% of the Japanese energy supply is sourced from renewables. At the time of writing, the Japanese parliament is discussing how to address nuclear energy, improve transportation infrastructure, and set aside funding for research and development of new technologies as well as improved environmental education through the bill.

CONCLUSIONS

As the foregoing comparison has shown, implementation of market-based solutions to climate policy is currently fully underway at the international, regional and national plane, although it has also met with a number of political and other challenges. Similar challenges are also likely to arise in emerging and developing countries implementing sophisticated and far reaching emissions trading systems, starting with the creation of suitable administrative structures. Differences will arise from different levels of commitment to and under a future international climate regime, and the different stages of domestic and regional policy development; states that have moved forward with the domestic operationalisation of climate policies will find it easier to overcome potential resistance from domestic stakeholders, and instead face the challenge of their domestic elaboration in a complex framework of environmental rules and other norms. Clearly, however, emissions trading has been designated the instrument of choice to implement climate mitigation efforts around the globe, and participants in the resulting carbon market stand to benefit from a number of opportunities.

DOCUMENTS

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (*UNFCCC*)

New York, 9 May 1992, in force 21 March 1994, 31 *International Legal Materials* (1992), 849.

The Parties to this Convention,

Acknowledging that change in the Earth's climate and its adverse effects are a common concern of humankind,

Concerned that human activities have been substantially increasing the atmospheric concentrations of greenhouse gases, that these increases enhance the natural greenhouse effect, and that this will result on average in an additional warming of the Earth's surface and atmosphere and may adversely affect natural ecosystems and humankind,

Noting that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs,

Aware of the role and importance in terrestrial and marine ecosystems of sinks and reservoirs of greenhouse gases,

Noting that there are many uncertainties in predictions of climate change, particularly with regard to the timing, magnitude and regional patterns thereof,

Acknowledging that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions,

Recalling the pertinent provisions of the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16 June 1972,

Recalling also that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction,

Reaffirming the principle of sovereignty of States in international cooperation to address climate change,

Recognizing that States should enact effective environmental legislation, that environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply, and that standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries,

(…)

Recognizing that steps required to understand and address climate change will be environmentally, socially and economically most effective if they are based on relevant scientific, technical and economic considerations and continually re-evaluated in the light of new findings in these areas,

Recognizing that various actions to address climate change can be justified economically in their own right and can also help in solving other environmental problems,

Recognizing also the need for developed countries to take immediate action in a flexible manner on the basis of clear priorities, as a first step towards comprehensive response strategies at the global, national and, where agreed, regional levels that take into account all greenhouse gases, with due consideration of their relative contributions to the enhancement of the greenhouse effect,

Recognizing further that low-lying and other small island countries, countries with low-lying coastal, arid and semi-arid areas or areas liable to floods, drought and desertification, and developing countries with fragile mountainous ecosystems are particularly vulnerable to the adverse effects of climate change,

Recognizing the special difficulties of those countries, especially developing countries, whose economies are particularly dependent on fossil fuel production, use and exportation, as a consequence of action taken on limiting greenhouse gas emissions,

Affirming that responses to climate change should be coordinated with social and economic development in an integrated manner with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty,

Recognizing that all countries, especially developing countries, need access to resources required to achieve sustainable social and economic development and that, in order for developing countries to progress towards that goal, their energy consumption will need to grow taking into account the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions in general, including through the application of new technologies on terms which make such an application economically and socially beneficial,

Determined to protect the climate system for present and future generations,

Have agreed as follows:

Article 1
Definitions

For the purposes of this Convention:

1. “Adverse effects of climate change” means changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.

2. “Climate change” means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

3. “Climate system” means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.

4. “Emissions” means the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time.

5. “Greenhouse gases” means those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation.

(…)

8. “Sink” means any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.

9. “Source” means any process or activity which releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere.

Article 2
Objective

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved 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.

Article 3
Principles

In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, INTER ALIA, by the following:

1. The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

2. The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration.

3. The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.

4. The Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change.

5. The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.

Article 4
Commitments

1. All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

(a) Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;

(b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;

(c) Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;

(d) Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;

(e) Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods;

(f) Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;

(g) Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;

(h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;

(i) Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non- governmental organizations; and

(j) Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12.

2. The developed country Parties and other Parties included in Annex I commit themselves specifically as provided for in the following:

(a) Each of these Parties shall adopt national1 policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs. These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol would contribute to such modification, and taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties to the global effort regarding that objective. These Parties may implement such policies and measures jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention and, in particular, that of this subparagraph;

(b) In order to promote progress to this end, each of these Parties shall communicate, within six months of the entry into force of the Convention for it and periodically thereafter, and in accordance with Article 12, detailed information on its policies and measures referred to in subparagraph (a) above, as well as on its resulting projected anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for the period referred to in subparagraph (a), with the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol. This information will be reviewed by the Conference of the Parties, at its first session and periodically thereafter, in accordance with Article 7;

(c) Calculations of emissions by sources and removals by sinks of greenhouse gases for the purposes of subparagraph (b) above should take into account the best available scientific knowledge, including of the effective capacity of sinks and the respective contributions of such gases to climate change. The Conference of the Parties shall consider and agree on methodologies for these calculations at its first session and review them regularly thereafter;

(d) The Conference of the Parties shall, at its first session, review the adequacy of subparagraphs (a) and (b) above. Such review shall be carried out in the light of the best available scientific information and assessment on

climate change and its impacts, as well as relevant technical, social and economic information. Based on this review, the Conference of the Parties shall take appropriate action, which may include the adoption of amendments to the commitments in subparagraphs (a) and (b) above. The Conference of the Parties, at its first session, shall also take decisions regarding criteria for joint implementation as indicated in subparagraph (a) above. A second review of subparagraphs (a) and (b) shall take place not later than 31 December 1998, and thereafter at regular intervals determined by the Conference of the Parties, until the objective of the Convention is met;

(e) Each of these Parties shall :

i) Coordinate as appropriate with other such Parties, relevant economic and administrative instruments developed to achieve the objective of the Convention; and

(ii) Identify and periodically review its own policies and practices which encourage activities that lead to greater levels of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol than would otherwise occur;

(f) The Conference of the Parties shall review, not later than 31 December 1998, available information with a view to taking decisions regarding such amendments to the lists in Annexes I and II as may be appropriate, with the approval of the Party concerned;

(g) Any Party not included in Annex I may, in its instrument of ratification, acceptance, approval or accession, or at any time thereafter, notify the Depositary that it intends to be bound by subparagraphs (a) and (b) above. The Depositary shall inform the other signatories and Parties of any such notification.

3. The developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under Article 12, paragraph 1. They shall also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of implementing measures that are covered by paragraph 1 of this Article and that are agreed between a developing country Party and the international entity or entities referred to in Article 11, in accordance with that Article. The implementation of these commitments shall take into account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among the developed country Parties.

4. The developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.

5. The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties. Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies.

6. In the implementation of their commitments under paragraph 2 above, a certain degree of flexibility shall be allowed by the Conference of the Parties to the Parties included in Annex I undergoing the process of transition to a market economy, in order to enhance the ability of these Parties to address climate change, including with regard to the historical level of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol chosen as a reference.

7. The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.

8. In the implementation of the commitments in this Article, the Parties shall give full consideration to what actions are necessary under the Convention, including actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change and/or the impact of the implementation of response measures, especially on:

(a) Small island countries;

(b) Countries with low-lying coastal areas;

(c) Countries with arid and semi-arid areas, forested areas and areas liable to forest decay;

(d) Countries with areas prone to natural disasters;

(e) Countries with areas liable to drought and desertification;

(f) Countries with areas of high urban atmospheric pollution;

(g) Countries with areas with fragile ecosystems, including mountainous ecosystems;

(h) Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products; and

(i) Land-locked and transit countries.

Further, the Conference of the Parties may take actions, as appropriate, with respect to this paragraph.

9. The Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology.

10. The Parties shall, in accordance with Article 10, take into consideration in the implementation of the commitments of the Convention the situation of Parties, particularly developing country Parties, with economies that are vulnerable to the adverse effects of the implementation of measures to respond to climate change. This applies notably to Parties with economies that are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels and associated energy-intensive products and/or the use of fossil fuels for which such Parties have serious difficulties in switching to alternatives.

(…)

Article 7
Conference of the Parties

1. A Conference of the Parties is hereby established.

2. The Conference of the Parties, as the supreme body of this Convention, shall keep under regular review the implementation of the Convention and any related legal instruments that the Conference of the Parties may adopt, and shall make, within its mandate, the decisions necessary to promote the effective implementation of the Convention. To this end, it shall:

(a) Periodically examine the obligations of the Parties and the institutional arrangements under the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge;

(b) Promote and facilitate the exchange of information on measures adopted by the Parties to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under the Convention;

(c) Facilitate, at the request of two or more Parties, the coordination of measures adopted by them to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under the Convention;

(d) Promote and guide, in accordance with the objective and provisions of the Convention, the development and periodic refinement of comparable methodologies, to be agreed on by the Conference of the Parties, inter alia, for preparing inventories of greenhouse gas emissions by sources and removals by sinks, and for evaluating the effectiveness of measures to limit the emissions and enhance the removals of these gases;

(e) Assess, on the basis of all information made available to it in accordance with the provisions of the Convention, the implementation of the Convention by the Parties, the overall effects of the measures taken pursuant to

the Convention, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved;

(f) Consider and adopt regular reports on the implementation of the Convention and ensure their publication;

(g) Make recommendations on any matters necessary for the implementation of the Convention;

(h) Seek to mobilize financial resources in accordance with Article 4, paragraphs 3, 4 and 5, and Article 11;

(i) Establish such subsidiary bodies as are deemed necessary for the implementation of the Convention;

(j) Review reports submitted by its subsidiary bodies and provide guidance to them;

(k) Agree upon and adopt, by consensus, rules of procedure and financial rules for itself and for any subsidiary bodies;

(l) Seek and utilize, where appropriate, the services and cooperation of, and information provided by, competent international organizations and intergovernmental and non-governmental bodies; and

(m) Exercise such other functions as are required for the achievement of the objective of the Convention as well as all other functions assigned to it under the Convention.

(…)

Article 8
Secretariat

1. A secretariat is hereby established.

2. The functions of the secretariat shall be:

(a) To make arrangements for sessions of the Conference of the Parties and its subsidiary bodies established under the Convention and to provide them with services as required;

(b) To compile and transmit reports submitted to it;

(c) To facilitate assistance to the Parties, particularly developing country Parties, on request, in the compilation and communication of information required in accordance with the provisions of the Convention;

(d) To prepare reports on its activities and present them to the Conference of the Parties;

(e) To ensure the necessary coordination with the secretariats of other relevant international bodies;

(f) To enter, under the overall guidance of the Conference of the Parties, into such administrative and contractual arrangements as may be required for the effective discharge of its functions; and

(g) To perform the other secretariat functions specified in the Convention and in any of its protocols and such other functions as may be determined by the Conference of the Parties.

3. The Conference of the Parties, at its first session, shall designate a permanent secretariat and make arrangements for its functioning.

Article 9
Subsidiary Body for Scientific and Technological Advice

1. A subsidiary body for scientific and technological advice is hereby established to provide the Conference of the Parties and, as appropriate, its other subsidiary bodies with timely information and advice on scientific and technological matters relating to the Convention. This body shall be open to participation by all Parties and shall be multidisciplinary. It shall comprise government representatives competent in the relevant field of expertise. It shall report regularly to the Conference of the Parties on all aspects of its work.

2. Under the guidance of the Conference of the Parties, and drawing upon existing competent international bodies, this body shall:

(a) Provide assessments of the state of scientific knowledge relating to climate change and its effects;

(b) Prepare scientific assessments on the effects of measures taken in the implementation of the Convention;

(c) Identify innovative, efficient and state-of-the-art technologies and know-how and advise on the ways and means of promoting development and/or transferring such technologies;

(d) Provide advice on scientific programmes, international cooperation in research and development related to climate change, as well as on ways and means of supporting endogenous capacity-building in developing countries; and

(e) Respond to scientific, technological and methodological questions that the Conference of the Parties and its subsidiary bodies may put to the body.

3. The functions and terms of reference of this body may be further elaborated by the Conference of the Parties.

Article 10
Subsidiary Body for Implementation

1. A subsidiary body for implementation is hereby established to assist the Conference of the Parties in the assessment and review of the effective implementation of the Convention. This body shall be open to participation by all Parties and comprise government representatives who are experts on matters related to climate change. It shall report regularly to the Conference of the Parties on all aspects of its work.

2. Under the guidance of the Conference of the Parties, this body shall:

(a) Consider the information communicated in accordance with Article 12, paragraph 1, to assess the overall aggregated effect of the steps taken by the Parties in the light of the latest scientific assessments concerning climate change;

(b) Consider the information communicated in accordance with Article 12, paragraph 2, in order to assist the Conference of the Parties in carrying out the reviews required by Article 4, paragraph 2(d); and

(c) Assist the Conference of the Parties, as appropriate, in the preparation and implementation of its decisions.

Article 11
Financial Mechanism

1. A mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology, is hereby defined. It shall function under the guidance of and be accountable to the Conference of the Parties, which shall decide on its policies, programme priorities and eligibility criteria related to this Convention. Its operation shall be entrusted to one or more existing international entities.

2. The financial mechanism shall have an equitable and balanced representation of all Parties within a transparent system of governance.

3. The Conference of the Parties and the entity or entities entrusted with the operation of the financial mechanism shall agree upon arrangements to give effect to the above paragraphs, which shall include the following:

(a) Modalities to ensure that the funded projects to address climate change are in conformity with the policies, programme priorities and eligibility criteria established by the Conference of the Parties;

(b) Modalities by which a particular funding decision may be reconsidered in light of these policies, programme priorities and eligibility criteria;

(c) Provision by the entity or entities of regular reports to the Conference of the Parties on its funding operations, which is consistent with the requirement for accountability set out in paragraph 1 above; and

(d) Determination in a predictable and identifiable manner of the amount of funding necessary and available for the implementation of this Convention and the conditions under which that amount shall be periodically reviewed.

4. The Conference of the Parties shall make arrangements to implement the above- mentioned provisions at its first session, reviewing and taking into account the interim arrangements referred to in Article 21, paragraph 3, and shall decide whether these interim arrangements shall be maintained. Within four years thereafter, the Conference of the Parties shall review the financial mechanism and take appropriate measures.

5. The developed country Parties may also provide and developing country Parties avail themselves of, financial resources related to the implementation of the Convention through bilateral, regional and other multilateral channels.

(…)

Article 14
Settlement of Disputes

1. In the event of a dispute between any two or more Parties concerning the interpretation or application of the Convention, the Parties concerned shall seek a settlement of the dispute through negotiation or any other peaceful means of their own choice.

2. When ratifying, accepting, approving or acceding to the Convention, or at any time thereafter, a Party which is not a regional economic integration organization may declare in a written instrument submitted to the Depositary that, in respect of any dispute concerning the interpretation or application of the Convention, it recognizes as compulsory ipso facto and without special agreement, in relation to any Party accepting the same obligation:

(a) Submission of the dispute to the International Court of Justice, and/or

(b) Arbitration in accordance with procedures to be adopted by the Conference of the Parties as soon as practicable, in an annex on arbitration.

A Party which is a regional economic integration organization may make a declaration with like effect in relation to arbitration in accordance with the procedures referred to in subparagraph (b) above.

3. A declaration made under paragraph 2 above shall remain in force until it expires in accordance with its terms or until three months after written notice of its revocation has been deposited with the Depositary.

4. A new declaration, a notice of revocation or the expiry of a declaration shall not in any way affect proceedings pending before the International Court of Justice or the arbitral tribunal, unless the parties to the dispute otherwise agree.

5. Subject to the operation of paragraph 2 above, if after twelve months following notification by one Party to another that a dispute exists between them, the Parties concerned have not been able to settle their dispute through the means mentioned in paragraph 1 above, the dispute shall be submitted, at the request of any of the parties to the dispute, to conciliation.

6. A conciliation commission shall be created upon the request of one of the parties to the dispute. The commission shall be composed of an equal number of members appointed by each party concerned and a chairman chosen jointly by the members appointed by each party. The commission shall render a recommendatory award, which the parties shall consider in good faith.

7. Additional procedures relating to conciliation shall be adopted by the Conference of the Parties, as soon as practicable, in an annex on conciliation.

8. The provisions of this Article shall apply to any related legal instrument which the Conference of the Parties may adopt, unless the instrument provides otherwise.

Article 15
Amendments to the Convention

1. Any Party may propose amendments to the Convention.

2. Amendments to the Convention shall be adopted at an ordinary session of the Conference of the Parties. The text of any proposed amendment to the Convention shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate proposed amendments to the signatories to the Convention and, for information, to the Depositary.

3. The Parties shall make every effort to reach agreement on any proposed amendment to the Convention by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

4. Instruments of acceptance in respect of an amendment shall be deposited with the Depositary. An amendment adopted in accordance with paragraph 3 above shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to the Convention.

5. The amendment shall enter into force for any other Party on the ninetieth day after the date on which that Party deposits with the Depositary its instrument of acceptance of the said amendment.

6. For the purposes of this Article, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

(…)

Article 17
Protocols

1. The Conference of the Parties may, at any ordinary session, adopt protocols to the Convention.

2. The text of any proposed protocol shall be communicated to the Parties by the secretariat at least six months before such a session.

3. The requirements for the entry into force of any protocol shall be established by that instrument.

4. Only Parties to the Convention may be Parties to a protocol.

5. Decisions under any protocol shall be taken only by the Parties to the protocol concerned.

(…)

Article 25
Withdrawal

1. At any time after three years from the date on which the Convention has entered into force for a Party, that Party may withdraw from the Convention by giving written notification to the Depositary.

2. Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the notification of withdrawal, or on such later date as may be specified in the notification of withdrawal.

3. Any Party that withdraws from the Convention shall be considered as also having withdrawn from any protocol to which it is a Party.

(…)

Annex I and Annex II Countries

Annex I

Australia
Austria
Belarus*

Belgium
Bulgaria*
Canada
Czechoslovakia*
Denmark
European Economic Community
Estonia*
Finland
France
Germany
Greece
Hungary*
Iceland
Ireland
Italy
Japan
Latvia*
Lithuania*
Luxembourg
Netherlands
New Zealand
Norway
Poland*
Portugal
Romania*
Russian Federation*
Spain
Sweden
Switzerland
Turkey
Ukraine*
United Kingdom of Great Britain and Northern Ireland
United States of America
*Countries that are undergoing the process of transition to a market economy.

Annex II

Australia
Austria
Belgium
Canada
Denmark
European Economic Community
Finland
France
Germany
Greece
Iceland
Ireland
Italy
Japan
Luxembourg
Netherlands
New Zealand
Norway
Portugal
Spain
Sweden
Switzerland
Turkey
United Kingdom of Great Britain and Northern Ireland
United States of America

KYOTO PROTOCOL TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (*KYOTO PROTOCOL*)

Kyoto, 10 December 1997, in force 16 February 2005, 37 *International Legal Materials* (1998), 22.

The Parties to this Protocol,

Being Parties to the United Nations Framework Convention on Climate Change, hereinafter referred to as "the Convention",

In pursuit of the ultimate objective of the Convention as stated in its Article 2,

Recalling the provisions of the Convention,

Being guided by Article 3 of the Convention,

Pursuant to the Berlin Mandate adopted by decision 1/CP.1 of the Conference of the Parties to the Convention at its first session,

Have agreed as follows:

Article 1
Definitions

For the purposes of this Protocol, the definitions contained in Article 1 of the Convention shall apply. In addition:

1. "Conference of the Parties" means the Conference of the Parties to the Convention.

2. "Convention" means the United Nations Framework Convention on Climate Change, adopted in New York on 9 May 1992.

3. "Intergovernmental Panel on Climate Change" means the Intergovernmental Panel on Climate Change established in 1988 jointly by the World Meteorological Organization and the United Nations Environment Programme.

(…)

5. "Parties present and voting" means Parties present and casting an affirmative or negative vote.

6. "Party" means, unless the context otherwise indicates, a Party to this Protocol.

7. "Party included in Annex I" means a Party included in Annex I to the Convention, as may be amended, or a Party which has made a notification under Article 4, paragraph 2(g), of the Convention.

Article 2
Policies and Measures

1. Each Party included in Annex I, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development, shall:

(a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:

(i) Enhancement of energy efficiency in relevant sectors of the national economy;

(ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;
(iii) Promotion of sustainable forms of agriculture in light of climate change considerations;
(iv) Research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;
(v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments;
(vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol;
(vii) Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;
(viii) Limitation and/or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy;

(b) Cooperate with other such Parties to enhance the individual and combined effectiveness of their policies and measures adopted under this Article, pursuant to Article 4, paragraph 2(e)(i), of the Convention. To this end, these Parties shall take steps to share their experience and exchange information on such policies and measures, including developing ways of improving their comparability, transparency and effectiveness. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, consider ways to facilitate such cooperation, taking into account all relevant information.

2. The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively.

3. The Parties included in Annex I shall strive to implement policies and measures under this Article in such a way as to minimize adverse effects, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties and in particular those identified in Article 4, paragraphs 8 and 9, of the Convention, taking into account Article 3 of the Convention. The Conference of the Parties serving as the meeting of the Parties to this Protocol may take further action, as appropriate, to promote the implementation of the provisions of this paragraph.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol, if it decides that it would be beneficial to coordinate any of the policies and measures in paragraph 1(a) above, taking into account different national circumstances and potential effects, shall consider ways and means to elaborate the coordination of such policies and measures.

Article 3
Commitments

1. The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.

2. Each Party included in Annex I shall, by 2005, have made demonstrable progress in achieving its commitments under this Protocol.

3. The net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this Article of each Party included in Annex I. The greenhouse gas emissions by sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner and reviewed in accordance with Articles 7 and 8.

4. Prior to the first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol, each Party included in Annex I shall provide, for consideration by the Subsidiary Body for Scientific and Technological Advice, data to establish its level of carbon stocks in 1990 and to enable an estimate to be made of its changes in carbon stocks in subsequent years. The Conference of the Parties serving as the meeting of the Parties

to this Protocol shall, at its first session or as soon as practicable thereafter, decide upon modalities, rules and guidelines as to how, and which, additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categories shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I, taking into account uncertainties, transparency in reporting, verifiability, the methodological work of the Intergovernmental Panel on Climate Change, the advice provided by the Subsidiary Body for Scientific and Technological Advice in accordance with Article 5 and the decisions of the Conference of the Parties. Such a decision shall apply in the second and subsequent commitment periods. A Party may choose to apply such a decision on these additional human-induced activities for its first commitment period, provided that these activities have taken place since 1990.

5. The Parties included in Annex I undergoing the process of transition to a market economy whose base year or period was established pursuant to decision 9/CP.2 of the Conference of the Parties at its second session shall use that base year or period for the implementation of their commitments under this Article. Any other Party included in Annex I undergoing the process of transition to a market economy which has not yet submitted its first national communication under Article 12 of the Convention may also notify the Conference of the Parties serving as the meeting of the Parties to this Protocol that it intends to use an historical base year or period other than 1990 for the implementation of its commitments under this Article. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall decide on the acceptance of such notification.

6. Taking into account Article 4, paragraph 6, of the Convention, in the implementation of their commitments under this Protocol other than those under this Article, a certain degree of flexibility shall be allowed by the Conference of the Parties serving as the meeting of the Parties to this Protocol to the Parties included in Annex I undergoing the process of transition to a market economy.

7. In the first quantified emission limitation and reduction commitment period, from 2008 to 2012, the assigned amount for each Party included in Annex I shall be equal to the percentage inscribed for it in Annex B of its aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A in 1990, or the base year or period determined in accordance with paragraph 5 above, multiplied by five. Those Parties included in Annex I for whom land-use change and forestry constituted a net source of greenhouse gas emissions in 1990 shall include in their 1990 emissions base year or period the aggregate anthropogenic carbon dioxide equivalent emissions by sources minus removals by sinks in 1990 from land-use change for the purposes of calculating their assigned amount.

8. Any Party included in Annex I may use 1995 as its base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride, for the purposes of the calculation referred to in paragraph 7 above.

9. Commitments for subsequent periods for Parties included in Annex I shall be established in amendments to Annex B to this Protocol, which shall be adopted in accordance with the provisions of Article 21, paragraph 7. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall initiate the consideration of such commitments at least seven years before the end of the first commitment period referred to in paragraph 1 above.

10. Any emission reduction units, or any part of an assigned amount, which a Party acquires from another Party in accordance with the provisions of Article 6 or of Article 17 shall be added to the assigned amount for the acquiring Party.

11. Any emission reduction units, or any part of an assigned amount, which a Party transfers to another Party in accordance with the provisions of Article 6 or of Article 17 shall be subtracted from the assigned amount for the transferring Party.

12. Any certified emission reductions which a Party acquires from another Party in accordance with the provisions of Article 12 shall be added to the assigned amount for the acquiring Party.

13. If the emissions of a Party included in Annex I in a commitment period are less than its assigned amount under this Article, this difference shall, on request of that Party, be added to the assigned amount for that Party for subsequent commitment periods.

14. Each Party included in Annex I shall strive to implement the commitments mentioned in paragraph 1 above in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. In line with relevant decisions of the Conference of the Parties on the implementation of those paragraphs, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, consider what actions are necessary

to minimize the adverse effects of climate change and/or the impacts of response measures on Parties referred to in those paragraphs. Among the issues to be considered shall be the establishment of funding, insurance and transfer of technology.

Article 4
'Bubble'

1. Any Parties included in Annex I that have reached an agreement to fulfil their commitments under Article 3 jointly, shall be deemed to have met those commitments provided that their total combined aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of Article 3. The respective emission level allocated to each of the Parties to the agreement shall be set out in that agreement.

(…)

3. Any such agreement shall remain in operation for the duration of the commitment period specified in Article 3, paragraph 7.

4. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization, any alteration in the composition of the organization after adoption of this Protocol shall not affect existing commitments under this Protocol. Any alteration in the composition of the organization shall only apply for the purposes of those commitments under Article 3 that are adopted subsequent to that alteration.

5. In the event of failure by the Parties to such an agreement to achieve their total combined level of emission reductions, each Party to that agreement shall be responsible for its own level of emissions set out in the agreement.

6. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization which is itself a Party to this Protocol, each member State of that regional economic integration organization individually, and together with the regional economic integration organization acting in accordance with Article 24, shall, in the event of failure to achieve the total combined level of emission reductions, be responsible for its level of emissions as notified in accordance with this Article.

Article 5
National System

1. Each Party included in Annex I shall have in place, no later than one year prior to the start of the first commitment period, a national system for the estimation of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol. Guidelines for such national systems, which shall incorporate the methodologies specified in paragraph 2 below, shall be decided upon by the Conference of the Parties serving as the meeting of the Parties to this Protocol at its first session.

2. Methodologies for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol shall be those accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties at its third session. Where such methodologies are not used, appropriate adjustments shall be applied according to methodologies agreed upon by the Conference of the Parties serving as the meeting of the Parties to this Protocol at its first session. (…)

3. The global warming potentials used to calculate the carbon dioxide equivalence of anthropogenic emissions by sources and removals by sinks of greenhouse gases listed in Annex A shall be those accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties at its third session. (…)

Article 6
Joint Implementation

1. For the purpose of meeting its commitments under Article 3, any Party included in Annex I may transfer to, or acquire from, any other such Party emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases in any sector of the economy, provided that:

(a) Any such project has the approval of the Parties involved;

(b) Any such project provides a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur;

(c) It does not acquire any emission reduction units if it is not in compliance with its obligations under Articles 5 and 7; and

(d) The acquisition of emission reduction units shall be supplemental to domestic actions for the purposes of meeting commitments under Article 3.

2. The Conference of the Parties serving as the meeting of the Parties to this Protocol may, at its first session or as soon as practicable thereafter, further elaborate guidelines for the implementation of this Article, including for verification and reporting.

3. A Party included in Annex I may authorize legal entities to participate, under its responsibility, in actions leading to the generation, transfer or acquisition under this Article of emission reduction units.

4. If a question of implementation by a Party included in Annex I of the requirements referred to in this Article is identified in accordance with the relevant provisions of Article 8, transfers and acquisitions of emission reduction units may continue to be made after the question has been identified, provided that any such units may not be used by a Party to meet its commitments under Article 3 until any issue of compliance is resolved.

Article 7
Inventory

1. Each Party included in Annex I shall incorporate in its annual inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol, submitted in accordance with the relevant decisions of the Conference of the Parties, the necessary supplementary information for the purposes of ensuring compliance with Article 3, to be determined in accordance with paragraph 4 below.

2. Each Party included in Annex I shall incorporate in its national communication, submitted under Article 12 of the Convention, the supplementary information necessary to demonstrate compliance with its commitments under this Protocol, to be determined in accordance with paragraph 4 below.

3. Each Party included in Annex I shall submit the information required under paragraph 1 above annually, beginning with the first inventory due under the Convention for the first year of the commitment period after this Protocol has entered into force for that Party. Each such Party shall submit the information required under paragraph 2 above as part of the first national communication due under the Convention after this Protocol has entered into force for it and after the adoption of guidelines as provided for in paragraph 4 below.

(…)

Article 8
Expert Review Teams

1. The information submitted under Article 7 by each Party included in Annex I shall be reviewed by expert review teams pursuant to the relevant decisions of the Conference of the Parties and in accordance with guidelines adopted for this purpose by the Conference of the Parties serving as the meeting of the Parties to this Protocol under paragraph 4 below.

(…)

2. Expert review teams shall be coordinated by the secretariat and shall be composed of experts selected from those nominated by Parties to the Convention and, as appropriate, by intergovernmental organizations, in accordance with guidance provided for this purpose by the Conference of the Parties.

3. The review process shall provide a thorough and comprehensive technical assessment of all aspects of the implementation by a Party of this Protocol. The expert review teams shall prepare a report to the Conference of the Parties serving as the meeting of the Parties to this Protocol, assessing the implementation of the commitments of the Party and identifying any potential problems in, and factors influencing, the fulfilment of commitments. Such reports shall be circulated by the secretariat to all Parties to the Convention.

(…)

Article 9
Review of the Protocol

1. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall periodically review this Protocol in the light of the best available scientific information and assessments on climate change and its impacts, as well as relevant technical, social and economic information. Such reviews shall be coordinated with pertinent reviews under the Convention, in particular those required by Article 4, paragraph 2(d), and Article 7, paragraph 2(a), of the Convention. Based on these reviews, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall take appropriate action.

2. The first review shall take place at the second session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. Further reviews shall take place at regular intervals and in a timely manner.

Article 10
Programmes and Activities

All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, without introducing any new commitments for Parties not included in Annex I, but reaffirming existing commitments under Article 4, paragraph 1, of the Convention, and continuing to advance the implementation of these commitments in order to achieve sustainable development, taking into account Article 4, paragraphs 3, 5 and 7, of the Convention, shall:

(a) Formulate, where relevant and to the extent possible, cost-effective national and, where appropriate, regional programmes to improve the quality of local emission factors, activity data and/or models which reflect the socio-economic conditions of each Party for the preparation and periodic updating of national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties, and consistent with the guidelines for the preparation of national communications adopted by the Conference of the Parties;

(b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change and measures to facilitate adequate adaptation to climate change:

(i) Such programmes would, inter alia, concern the energy, transport and industry sectors as well as agriculture, forestry and waste management. Furthermore, adaptation technologies and methods for improving spatial planning would improve adaptation to climate change; and
(ii) Parties included in Annex I shall submit information on action under this Protocol, including national programmes, in accordance with Article 7; and other Parties shall seek to include in their national communications, as appropriate, information on programmes which contain measures that the Party believes contribute to addressing climate change and its adverse impacts, including the abatement of increases in greenhouse gas emissions, and enhancement of and removals by sinks, capacity building and adaptation measures;

(c) Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, environmentally sound technologies;

(d) Cooperate in scientific and technical research and promote the maintenance and the development of systematic observation systems and development of data archives to reduce uncertainties related to the climate system, the adverse impacts of climate change and the economic and social consequences of various response strategies, and promote the development and strengthening of endogenous capacities and capabilities to participate in international and intergovernmental efforts, programmes and networks on research and systematic observation, taking into account Article 5 of the Convention;

(e) Cooperate in and promote at the international level, and, where appropriate, using existing bodies, the development and implementation of education and training programmes, including the strengthening of national capacity building, in particular human and institutional capacities and the exchange or secondment of personnel to train experts in this field, in particular for developing countries, and facilitate at the national level public aware-

ness of, and public access to information on, climate change. Suitable modalities should be developed to implement these activities through the relevant bodies of the Convention, taking into account Article 6 of the Convention; (…)

Article 11
Financial Mechanism

1. In the implementation of Article 10, Parties shall take into account the provisions of Article 4, paragraphs 4, 5, 7, 8 and 9, of the Convention.

2. In the context of the implementation of Article 4, paragraph 1, of the Convention, in accordance with the provisions of Article 4, paragraph 3, and Article 11 of the Convention, and through the entity or entities entrusted with the operation of the financial mechanism of the Convention, the developed country Parties and other developed Parties included in Annex II to the Convention shall:

(a) Provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in advancing the implementation of existing commitments under Article 4, paragraph 1(a), of the Convention that are covered in Article 10, subparagraph (a); and

(b) Also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of advancing the implementation of existing commitments under Article 4, paragraph 1, of the Convention that are covered by Article 10 and that are agreed between a developing country Party and the international entity or entities referred to in Article 11 of the Convention, in accordance with that Article.

The implementation of these existing commitments shall take into account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among developed country Parties. The guidance to the entity or entities entrusted with the operation of the financial mechanism of the Convention in relevant decisions of the Conference of the Parties, including those agreed before the adoption of this Protocol, shall apply *mutatis mutandis* to the provisions of this paragraph.

3. The developed country Parties and other developed Parties in Annex II to the Convention may also provide, and developing country Parties avail themselves of, financial resources for the implementation of Article 10, through bilateral, regional and other multilateral channels.

Article 12
Clean Development Mechanism

1. A clean development mechanism is hereby defined.

2. The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.

3. Under the clean development mechanism:

(a) Parties not included in Annex I will benefit from project activities resulting in certified emission reductions; and

(b) Parties included in Annex I may use the certified emission reductions accruing from such project activities to contribute to compliance with part of their quantified emission limitation and reduction commitments under Article 3, as determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

4. The clean development mechanism shall be subject to the authority and guidance of the Conference of the Parties serving as the meeting of the Parties to this Protocol and be supervised by an executive board of the clean development mechanism.

5. Emission reductions resulting from each project activity shall be certified by operational entities to be designated by the Conference of the Parties serving as the meeting of the Parties to this Protocol, on the basis of:

(a) Voluntary participation approved by each Party involved;

(b) Real, measurable, and long-term benefits related to the mitigation of climate change; and

(c) Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.

6. The clean development mechanism shall assist in arranging funding of certified project activities as necessary.

7. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, elaborate modalities and procedures with the objective of ensuring transparency, efficiency and accountability through independent auditing and verification of project activities.

8. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall ensure that a share of the proceeds from certified project activities is used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.

9. Participation under the clean development mechanism, including in activities mentioned in paragraph 3(a) above and in the acquisition of certified emission reductions, may involve private and/or public entities, and is to be subject to whatever guidance may be provided by the executive board of the clean development mechanism.

10. Certified emission reductions obtained during the period from the year 2000 up to the beginning of the first commitment period can be used to assist in achieving compliance in the first commitment period.

Article 13
Meeting of the Parties

1. The Conference of the Parties, the supreme body of the Convention, shall serve as the meeting of the Parties to this Protocol.

2. Parties to the Convention that are not Parties to this Protocol may participate as observers in the proceedings of any session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. When the Conference of the Parties serves as the meeting of the Parties to this Protocol, decisions under this Protocol shall be taken only by those that are Parties to this Protocol.

(…)

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall keep under regular review the implementation of this Protocol and shall make, within its mandate, the decisions necessary to promote its effective implementation. It shall perform the functions assigned to it by this Protocol and shall:

(a) Assess, on the basis of all information made available to it in accordance with the provisions of this Protocol, the implementation of this Protocol by the Parties, the overall effects of the measures taken pursuant to this Protocol, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved;

(b) Periodically examine the obligations of the Parties under this Protocol, giving due consideration to any reviews required by Article 4, paragraph 2(d), and Article 7, paragraph 2, of the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge, and in this respect consider and adopt regular reports on the implementation of this Protocol;

(…)

(f) Make recommendations on any matters necessary for the implementation of this Protocol;

(…)

(j) Exercise such other functions as may be required for the implementation of this Protocol, and consider any assignment resulting from a decision by the Conference of the Parties.

5. The rules of procedure of the Conference of the Parties and financial procedures applied under the Convention shall be applied *mutatis mutandis* under this Protocol, except as may be otherwise decided by consensus by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

6. The first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be convened by the secretariat in conjunction with the first session of the Conference of the Parties that is scheduled after the date of the entry into force of this Protocol. Subsequent ordinary sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be held every year and in conjunction with ordinary sessions of the Conference of the Parties, unless otherwise decided by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

(…)

Article 14
Secretariat

1. The secretariat established by Article 8 of the Convention shall serve as the secretariat of this Protocol.

(…)

Article 17
International Emissions Trading

The Conference of the Parties shall define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading. The Parties included in Annex B may participate in emissions trading for the purposes of fulfilling their commitments under Article 3. Any such trading shall be supplemental to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that Article.

Article 18
Compliance Mechanism

The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, approve appropriate and effective procedures and mechanisms to determine and to address cases of non-compliance with the provisions of this Protocol, including through the development of an indicative list of consequences, taking into account the cause, type, degree and frequency of non-compliance. Any procedures and mechanisms under this Article entailing binding consequences shall be adopted by means of an amendment to this Protocol.

Article 19
Dispute Settlement

The provisions of Article 14 of the Convention on settlement of disputes shall apply mutatis mutandis to this Protocol.

Article 20
Amendments

1. Any Party may propose amendments to this Protocol.

2. Amendments to this Protocol shall be adopted at an ordinary session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. The text of any proposed amendment to this Protocol shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate the text of any proposed amendments to the Parties and signatories to the Convention and, for information, to the Depositary.

3. The Parties shall make every effort to reach agreement on any proposed amendment to this Protocol by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

Article 21
1. Annexes to this Protocol shall form an integral part thereof and, unless otherwise expressly provided, a reference to this Protocol constitutes at the same time a reference to any annexes thereto. Any annexes adopted after the entry into force of this Protocol shall be restricted to lists, forms and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character.

2. Any Party may make proposals for an annex to this Protocol and may propose amendments to annexes to this Protocol.

3. Annexes to this Protocol and amendments to annexes to this Protocol shall be adopted at an ordinary session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. The text of any proposed annex or amendment to an annex shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. (…)

4. The Parties shall make every effort to reach agreement on any proposed annex or amendment to an annex by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the annex or amendment to an annex shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted annex or amendment to an annex shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

Article 26
Reservations

No reservations may be made to this Protocol.

Article 27
Withdrawal

1. At any time after three years from the date on which this Protocol has entered into force for a Party, that Party may withdraw from this Protocol by giving written notification to the Depositary.

2. Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the notification of withdrawal, or on such later date as may be specified in the notification of withdrawal.

3. Any Party that withdraws from the Convention shall be considered as also having withdrawn from this Protocol.

(…)

Annexes

Annex A

Greenhouse gases

Carbon dioxide (CO_2)
Methane (CH_4)
Nitrous oxide (N_2O)
Hydrofluorocarbons (HFCs)
Perfluorocarbons (PFCs)
Sulphur hexafluoride (SF_6)

(…)

Annex B

Party Quantified emission limitation or reduction commitment
(percentage of base year or period)

Australia 108

Austria 92
Belgium 92
Bulgaria* 92
Canada 94
Croatia* 95
Czech Republic* 92
Denmark 92
Estonia* 92
European Community 92
Finland 92
France 92
Germany 92
Greece 92
Hungary* 94
Iceland 110
Ireland 92
Italy 92
Japan 94
Latvia* 92
Liechtenstein 92
Lithuania* 92
Luxembourg 92
Monaco 92
Netherlands 92
New Zealand 100
Norway 101
Poland* 94
Portugal 92
Romania* 92
Russian Federation* 100
Slovakia* 92
Slovenia* 92
Spain 92
Sweden 92
Switzerland 92
Ukraine* 100
United Kingdom of Great Britain and Northern Ireland 92
United States of America 93

* Countries that are undergoing the process of transition to a market economy.

COPENHAGEN ACCORD

Decision 2/CP.15, UN Doc. FCCC/CP/2009/11/Add.1

The Conference of the Parties,
Takes note of the Copenhagen Accord of 18 December 2009.

Copenhagen Accord

The Heads of State, Heads of Government, Ministers, and other heads of the following delegations present at the United Nations Climate Change Conference 2009 in Copenhagen:1 Albania, Algeria, Armenia, Australia, Austria, Bahamas, Bangladesh, Belarus, Belgium, Benin, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Canada, Central African Republic, Chile, China, Colombia, Congo, Costa Rica, Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Democratic Republic of the Congo, Denmark, Djibouti, Eritrea, Estonia, Ethiopia, European Union, Fiji, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guyana, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kiribati, Lao People's Democratic Republic, Latvia, Lesotho, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malawi, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mexico, Monaco, Mongolia, Montenegro, Morocco, Namibia, Nepal, Netherlands, New Zealand, Norway, Palau, Panama, Papua New Guinea, Peru, Poland, Portugal, Republic of Korea, Republic of Moldova, Romania, Russian Federation, Rwanda, Samoa, San Marino, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, Spain, Swaziland, Sweden, Switzerland, the former Yugoslav Republic of Macedonia, Tonga, Trinidad and Tobago, Tunisia, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, United States of America, Uruguay and Zambia,

In pursuit of the ultimate objective of the Convention as stated in its Article 2,

Being guided by the principles and provisions of the Convention,

Noting the results of work done by the two Ad hoc Working Groups,

Endorsing decision 1/CP.15 on the Ad hoc Working Group on Long-term Cooperative Action and decision 1/CMP.5 that requests the Ad hoc Working Group on Further Commitments of Annex I Parties under the Kyoto Protocol to continue its work,

Have agreed on this Copenhagen Accord which is operational immediately.

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.

3. Adaptation to the adverse effects of climate change and the potential impacts of response measures is a challenge faced by all countries. Enhanced action and international cooperation on adaptation is urgently required to ensure the implementation of the Convention by enabling and supporting the implementation of adaptation actions aimed at reducing vulnerability and building resilience in developing countries, especially in those that are particularly vulnerable, especially least developed countries, small island developing States and Africa. We agree that developed countries shall provide adequate, predictable and sustainable financial resources, technology and capacity-building to support the implementation of adaptation action in developing countries.

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.

5. Non-Annex I Parties to the Convention will implement mitigation actions, including those to be submitted to the secretariat by non-Annex I Parties in the format given in Appendix II by 31 January 2010, for compilation in an INF document, consistent with Article 4.1 and Article 4.7 and in the context of sustainable development. Least developed countries and small island developing States may undertake actions voluntarily and on the basis of support. Mitigation actions subsequently taken and envisaged by Non-Annex I Parties, including national inventory reports, shall be communicated through national communications consistent with Article 12.1(b) every two years on the basis of guidelines to be adopted by the Conference of the Parties. Those mitigation actions in national communications or otherwise communicated to the Secretariat will be added to the list in appendix II. Mitigation actions taken by Non-Annex I Parties will be subject to their domestic measurement, reporting and verification the result of which will be reported through their national communications every two years. Non-Annex I Parties will communicate information on the implementation of their actions through National Communications, with provisions for international consultations and analysis under clearly defined guidelines that will ensure that national sovereignty is respected. Nationally appropriate mitigation actions seeking international support will be recorded in a registry along with relevant technology, finance and capacity building support. Those actions supported will be added to the list in appendix II. These supported nationally appropriate mitiga-

tion actions will be subject to international measurement, reporting and verification in accordance with guidelines adopted by the Conference of the Parties.

6. We recognize the crucial role of reducing emission from deforestation and forest degradation and the need to enhance removals of greenhouse gas emission by forests and agree on the need to provide positive incentives to such actions through the immediate establishment of a mechanism including REDD-plus, to enable the mobilization of financial resources from developed countries.

7. We decide to pursue various approaches, including opportunities to use markets, to enhance the cost-effectiveness of, and to promote mitigation actions. Developing countries, especially those with low emitting economies should be provided incentives to continue to develop on a low emission pathway.

8. Scaled up, new and additional, predictable and adequate funding as well as improved access shall be provided to developing countries, in accordance with the relevant provisions of the Convention, to enable and support enhanced action on mitigation, including substantial finance to reduce emissions from deforestation and forest degradation (REDD-plus), adaptation, technology development and transfer and capacity-building, for enhanced implementation of the Convention. The collective commitment by developed countries is to provide new and additional resources, including forestry and investments through international institutions, approaching USD 30 billion for the period 2010-2012 with balanced allocation between adaptation and mitigation. Funding for adaptation will be prioritized for the most vulnerable developing countries, such as the least developed countries, small island developing States and Africa. In the context of meaningful mitigation actions and transparency on implementation, developed countries commit to a goal of mobilizing jointly USD 100 billion dollars a year by 2020 to address the needs of developing countries. This funding will come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance. New multilateral funding for adaptation will be delivered through effective and efficient fund arrangements, with a governance structure providing for equal representation of developed and developing countries. A significant portion of such funding should flow through the Copenhagen Green Climate Fund.

9. To this end, a High Level Panel will be established under the guidance of and accountable to the Conference of the Parties to study the contribution of the potential sources of revenue, including alternative sources of finance, towards meeting this goal.

10. We decide that the Copenhagen Green Climate Fund shall be established as an operating entity of the financial mechanism of the Convention to support projects, programme, policies and other activities in developing countries related to mitigation including REDD-plus, adaptation, capacity-building, technology development and transfer.

11. In order to enhance action on development and transfer of technology we decide to establish a Technology Mechanism to accelerate technology development and transfer in support of action on adaptation and mitigation that will be guided by a country-driven approach and be based on national circumstances and priorities.

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.

[1] For an overview, see T. Tietenberg, 'Economic Instruments for Environmental Regulation' (1990) 6.1 *Oxford Review of Economic Policy*, 17.
[2] B. Ackerman and R. Stewart, 'Reforming Environmental Law' (1985) 37 *Stanford Law Review*, 1333.
[3] R. Stewart, 'A New Generation of Environmental Regulation?' (2001) 30 *Capital University Law Review*, 21; this trend also involves the 'development of information-based systems to encourage internalization of environmental norms by business and other organizations; and integrated approaches to environmental planning and management nationally and at the ecosystem level', *ibid*.
[4] J. H. Dales, *Pollution, Property and Prices* (Toronto: University of Toronto Press, 1968), 92-100; this instrument is also partly credited to T. Crocker, 'The Structuring of Atmospheric Pollution Control Systems' in H. Wolozing (ed.), *The Economics of Air Pollution* (New York, N.Y.: W. W. Norton, 1966), 61-86.
[5] Such pricing models based on the notion of environmental fees date back to research by A. C. Pigou, and include emissions or effluent charges, taxes, and subsidies set to cover the marginal damage caused by pollutant activities, thereby internalizing their costs, see W. J. Baumol and W. E. Oates, *The Theory of Environmental Policy* (Cambridge: Cambridge University Press, 1988), 58.
[6] An overview of this mechanism is given by N. Mercuro, 'Environmental Economic Remedies' in N. Mercuro (ed.), *Ecology, Law and Economics* (Lanham, MD: University Press of America, 1997), 200.
[7] For global CO2 emissions, for instance, studies estimate the savings in reduction costs at between 50 and 70 per cent of the initial burden, see J. B. Wiener, 'Borrowing Something for Something Blue: Legal Transplants and the Evolution of Global Environmental Law' (2001) 27 *Ecology Law Quarterly*, 1327.
[8] L.H. Goulder and B. Nadreau, 'International Approaches to Reducing Greenhouse Gas Emissions' in S. H. Schneider, A. Rosencranz and J. O. Niles (eds.), *Climate Change Policy: A Survey* (Washington, D.C.: Island Press, 2002), 122-5.
[9] Such corrective action can be needed to compensate the effects of economic growth and price inflation on effluent fees, or to adjust for overly low rates that fail to provide the intended behavioural effect.
[10] This resistance to 'wholesale changes in policy' is cited as one of the main reasons for past reticence towards the adoption of economic instruments in environmental protection, see N. Hanley, Jason F. Shogren and B. White, *Environmental Economics in Theory and Practice* (Houndmills: Macmillan Press, 1997), 154-5.
[11] See, notably, S. Kelman, 'Economists and the Environmental Policy Muddle' (1981) 64 *Public Interest*, 106-23.
[12] This is likely to occur, for instance, when allowances are allocated at no cost ('grandfathering'), see J. R. Nash, 'Too Much Market? Conflict Between Tradable Pollution Allowances and the "Polluter Pays" Principle' (2000) 24 *Harvard Environmental Law Review*, 465-535.
[13] Such 'non-attainment areas' are defined as 'any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard' for certain pollutants, see CAA § 107(d)(1)(A)(i), 42 U.S.C. § 7407(d)(1)(A)(i) (1994).
[14] Such 'non-attainment areas' are defined as 'any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard' for certain pollutants, see CAA § 107(d)(1)(A)(i), 42 U.S.C. § 7407(d)(1)(A)(i) (1994).
[15] Pursuant to CAA § 173(a)(1)(A), 42 U.S.C. § 7503 (a)(1)(A) (1994), 'permits to construct and operate may be issued if . . . the permitting agency determines that . . . sufficient offsetting emissions reductions have been obtained, such that total allowable emissions from existing sources in the region, from new or modified sources which are not major emitting facilities, and from the proposed source will be sufficiently less than total emissions from existing sources.'
[16] Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto, 10 Dec. 1997), U.N. Doc. FCCC/CP/1997/L.7/Add.1, (1998) 37 *International Legal Materials*, 22; the protocol elaborates on the United Nations Framework Convention on Climate Change (Rio de Janeiro, 4 June 1992), in force 21 March 1994, U.N. Doc. A/CONF.151/26, (1992) 31 *International Legal Materials*, 849.
[17] For a detailed description of the greenhouse effect, see Richard Wolfson and Stephen H. Schneider, 'Understanding Climate Science', in Stephen H. Schneider, Armin Rosencranz, and John O. Niles (eds.), *Climate Change Policy: A Survey* (Washington D.C.: Island Press, 2002), 8-10.
[18] These are, in particular, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapour (H_2O).
[19] This discovery is usually ascribed to Swedish chemist S. Arrhenius, who first formulated the idea in 1896; the history of climate science is carefully traced by Spencer R. Weart, *The Discovery of Global Warming* (Cambridge: Harvard University Press, 2004), *passim*.
[20] As the IPCC affirmed in its Third Assessment Report, the atmospheric concentration of CO_2 has increased by over 30% above pre-industrial levels since 1750, John T. Houghton *et al.* (eds.), *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the IPCC* (Cambridge: Cambridge University Press, 2001), 358 (Table 6.1).

[21] For an authoritative introduction to the scientific background, see John T. Houghton, *Global Warming: The Complete Briefing*, 3rd ed. (Cambridge: Cambridge University Press, 2004).
[22] An overview can be found at Daniel Bodansky, 'The History of the Global Climate Change Regime', in Urs Luterbacher and Detlef F. Sprintz (eds.), *International Relations and Global Climate Change* (Cambridge: MIT Press, 2001), 24-31.
[23] More specifically, the mandate was to 'provide internationally co-ordinated scientific assessments of the magnitude, timing and potential environmental and socio-economic impacts of climate change and realistic response strategies', Protection of Global Climate for Present and Future Generations of Mankind, GA Res. 43/53, 6 December 1988. This mandate is reflected in the organisational structure of the IPCC, whose Working Groups are devoted to the science of climate change (WG I), to impacts and responses (WG II) and to the economic and social dimensions (WG III). So far, the IPCC has published three comprehensive Assessment Reports, in 1990, 1995, and 2001.
[24] See, *inter alia*, Sonja Boehmer-Christiansen, 'Global Climate Protection Policy: The Limits of Scientific Advice', 4 *Global Environmental Change* (1994), 141, chastising the IPCC for deliberately creating 'concern in order to demonstrate policy relevance and attract public funding'; Boehmer-Christiansen has upheld her critical position in a more recent book with Aynsley J. Kellow, *International Environmental Policy: Interests and the Failure of the Kyoto Process* (Cheltenham: Edward Elgar, 2002).
[25] GA Res, 43/53, *supra* note 23.
[26] Protection of Global Climate for Present and Future Generations of Mankind, GA Res. 45/212, 21 December 1990, which established an Intergovernmental Negotiating Committee (INC).
[27] On the negotiations, see Daniel Bodansky, 'Prologue to the Climate Change Convention', in Irving Mintzer and J.Amber Leonard (eds.), *Negotiating Climate Change: The Inside Story of the Rio Convention* (Cambridge: Cambridge University Press, 1994), 45; Daniel Goldberg, 'As the World Burns: Negotiating the Framework Convention on Climate Change', 5 *Georgetown International Environmental Law Review* (1993), 244-51.
[28] United Nations Framework Convention on Climate Change (UNFCCC), New York, 9 May 1992, in force 21 March 1994, 31 *International Legal Materials* (1992) 849; the status of ratification in published on the Internet at <http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php> (last accessed on 20 January 2006).
[29] On the role of unanimous consent and its detrimental consequences for international environmental governance, see Goffrey Palmer, 'New Ways to Make International Environmental Law', 86 *American Journal of International Law* (1992), 270-78.
[30] This was amply reflected by the various factions shaped in the course of negotiations; whereas the United States and representatives of OPEC favoured 'soft' commitments allowing for national margins of discretion, the most threatened countries convened in an Alliance of Small Island States (AOSIS) to demand quantified reduction targets, and developing countries, meanwhile, categorical insistence that any commitments do not compromise their prospects for further economic development. The outcome of any attempt to unite these countervailing positions obviously had to be a compromise deal, see Philippe Sands, 'The United Nations Framework Convention on Climate Change', 1 *Review of European Community and International Environmental Law* (1992), 270.
[31] See, for instance, the relationship between the Vienna Convention for the Protection of the Ozone Layer, Vienna, 22 March 1985, in force 22 September 1988, 26 *International Legal Materials* (1985) 1529, and the Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 16 September 1987, in force 1 January 1989, 26 *International Legal Materials* (1987) 1550.
[32] This approach to environmental diplomacy is credited with facilitating consensus within a shorter timeframe, while also increasing the ability of the regime to dynamically adapt to rapidly changing factual and legal circumstances, see generally Lawrence E. Susskind, *Environmental Diplomacy: Negotiating More Effective Global Agreements* (Oxford: Oxford University Press, 1994).
[33] See Article 2 of the UNFCCC; as this provision goes on to state, '[s]uch a level should be achieved 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.'
[34] See, for instance, Daniel Bodansky, 'The United Nations Framework Convention on Climate Change: A Commentary', 18 *Yale Journal of International Law* (1993), 500, who also doubts whether this objective might be qualified as an 'object and purpose' for reasons of treaty interpretation, and whether it calls for preventive action; recently, this provisions has again become subject to renewed discussion, see Konrad Ott *et al.*, *Reasoning Goals of Climate Protection: Specification of Article 2 UNFCCC* (Berlin: Umweltbundesamt, 2004).
[35] Uncertainties as to the changes in temperature and greenhouse gas levels which may be considered dangerous have resulted in numerous different suggestions; the European Union, for instance, has unilaterally chosen to define its benchmark at a global temperature change of two degrees Celsius, see European Council, 1939th Council Meeting, Luxembourg, 25 June 1996: 'the Council ... ACKNOWLEDGES that to meet the ultimate objective of the UNFCCC to prevent dangerous anthropogenic interference with the climate system, overall global temperature increase should not exceed 2ºC above pre-industrial levels.'

[36] Article 3 of the UNFCCC; for a discussion of these principles, see Farhana Yamin and Joanna Depledge, *The International Climate Change Regime: A Guide to Rules, Institutions and Procedures* (Cambridge: Cambridge University Press, 2004), 66-73.
[37] Such differentiation has been characteristic of international environmental governance in the past decade, see, for instance, Principle 7 of the Rio Declaration on Environment and Development, 31 *International Legal Materials* (1992) 874: 'In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command'; for a general discussion, see Christopher D. Stone, 'Common but Differentiated Responsibilities in International Law', 98 *American Journal of International Law* (2004), 276.
[38] See Articles 4 (1), 5, 6 and 12 (1) of the UNFCCC. The foregoing commitments apply to 'all greenhouse gases not controlled by the Montreal Protocol'; as Article 1 lit. 1 UNFCCC specifies, '"[g]reenhouse gases" means those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation,' taking account of both emissions by sources or removals by sinks.
[39] See Annex I of the UNFCCC, which lists member states of the Organisation of Economic Co-operation and Development (OECD) and former planned economies of Central and Eastern Europe currently undergoing the process of transition to a market economy.
[40] See Article 4 (2) (a) and (b) of the UNFCCC.
[41] Article 7 (2) of the UNFCCC, which sets out a detailed mandate of the COP.
[42] See Article 8 of the UNFCCC.
[43] These are the Subsidiary Body for Scientific and Technological Advice (SBSTA), Article 9 of the UNFCCC, and the Subsidiary Body for Implementation (SBI), Article 10 of the UNFCCC.
[44] Articles 11 and 21 (3) of the UNFCCC.
[45] Article 4 (2) (d) of the UNFCCC.
[46] Decision 1/CP.1, UN Doc. FCCC/CP/1995/7/Add.1; only developed countries were to enter new commitments, whereas developing countries would continue with their existing commitments.
[47] UN Doc. FCCC/CP/1996/L.17.
[48] This was the Second Assessment Report (SAR), which, for the first time, stated that "the balance of evidence suggests that there is a discernible human influence on global climate," see John T. Houghton *et al.* (eds.), *Climate Change 1995: The Science of Climate Change. Contribution of Working Group 1 to the Second Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 1996), 4-5.
[49] UN Doc. FCCC/CP/1996/L.17, lit. 8.
[50] In the negotiations leading up to Kyoto and subsequent summits, the United States was joined by other states – Japan, Switzerland, Canada, Australia, Norway and New Zealand – in an informal coalition known as 'JUSSCANNZ' (also referred to as the 'Umbrella Group', with Russia and the Ukraine) to advocate the 'least cost principle' and oppose mandatory reduction targets and the precautionary approach favoured by the European Union; meanwhile, developing countries were unable to assemble as a unified front, with interests divided among different groups, notably AOSIS as a proponent of strong reduction obligations, OPEC with an obscure agenda ultimately based on its reliance on fossil fuel sales, the G-77 focused on benefits for the South and resisting commitments for developing countries, and several economies in transition hoping to profit from the dramatic reduction of greenhouse gas emissions following the collapse of the Soviet Union, see generally Sebastian Oberthür and Hermann Ott, *Das Kyoto-Protokoll: Internationale Klimapolitik für das 21. Jahrhundert* (Opladen: Leske und Budrich, 2000).
[51] Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol), Kyoto, 10 December 1997, in force 16 February 2005, 37 *International Legal Materials* (1998) 22.
[52] Both are outlined in greater detail in the the following sections 2 and 3.
[53] Under Article 25 (1) of the Kyoto Protocol, it would enter into force once fifty-five states 'deposited their instruments of ratification, acceptance, approval or accession', on the condition that those states account for at least 55 % of the 1990 CO_2 emissions by developed states.
[54] Decision 1/CP.4, UN Doc. FCCC/CP/1998/16/Add.1.
[55] See, *inter alia*, Urs S. Brandt and Gert T. Svendsen, 'Hot Air in Kyoto, Cold Air in the Hague: The Failure of Global Climate Negotiations', 30 *Energy Policy* (2002), 1197-8, and Suraje Dessai, Nuno S. Lacasta and Katherine Vincent, 'International Political History of the Kyoto Protocol: From The Hague to Marrakech and Beyond', 4 *International Review for Environmental Strategies* (2003), 183.
[56] Decision 5/CP.6, UN Doc. FCCC/CP/2001/5, primarily relating to the flexibility mechanisms, the use of sinks, the compliance mechanism and support for developing countries.
[57] Decisions 2-24/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2.

[58] Accession to the World Trade Organization (WTO) was apparently an important consideration for the Russian decision to ratify; see Charles Digges, 'Putin Signals Russia Will Sign Kyoto Protocol for WTO Membership', published on the Internet at <www.bellona.no/en/energy/34179.html> (last accessed on 20 January 2006).
[59] These commitments apply to the same group of industrialised states and economies in transition listed in Annex I to the parent convention, see Articles 2, 3, 5 and 7 of the Kyoto Protocol.
[60] Article 2 (1) of the Kyoto Protocol.
[61] See Article 10 of the Kyoto Protocol, which elaborates on commitments under the UNFCCC, notably in Article 4 (1) of the UNFCCC.
[62] Article 1 of the Kyoto Protocol.
[63] Article 11 of the Kyoto Protocol.
[64] Articles 9, 13 to 16 of the Kyoto Protocol.
[65] Articles 18 and 19 of the Kyoto Protocol.
[66] Articles 4, 6, 12 and 17 of the Kyoto Protocol.
[67] Articles 20 to 28 of the Kyoto Protocol.
[68] Annex A lists six greenhouse gases, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), as well as hydrofluoro- and perfluorocarbons (collectively referred to as HFC and PFC); Annex B contains a list of industrialized countries and economies in transition, specifying reduction commitments for each party.
[69] Article 3 (1) of the Kyoto Protocol; as the reference to 'jointly' and Article 4 clarify, parties are allowed to meet their commitments jointly or in the framework of a regional economic integration organization, and 'shall be deemed to have met those commitments provided that their total combined aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts.'
[70] Article 3 (5) and (7) of the Kyoto Protocol; see also Decision 9/CP.2, UN Doc. FCCC/CP/1996/15/Add.1.
[71] Article 3 (3) of the Kyoto Protocol.
[72] Article 3 (2) of the Kyoto Protocol; according to a press release of the UNFCCC secretariat of 16 February 2006, 'many countries have already made significant progress in putting in place policies, and enacting relevant legislative, regulatory and institutional frameworks for achieving their Kyoto commitments.' As the press release goes on to clarify, however, 'it was clear that many Parties to the Kyoto Protocol would have to sustain or even intensify their efforts.' Published on the Internet at <http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/20060214_anniversary_kp_entry_into_force.pdf> (last accessed 20 February 2006).
[73] Occasionally, joint fulfilment of commitments under Article 4 of the Kyoto Protocol is also counted towards the flexibility mechanisms..
[74] The United States and Japan, notably, insisted on the inclusion of emissions trading in the Kyoto Protocol, whereas major developing countries, including India and China, opposed it; likewise, the inclusion of project mechanisms, largely favoured by the industrialised powers, met with initial resistance by several developing countries, who feared a "neo-colonialist" outcome and instead supported a fund based on financial penalties for developed countries violating their mitigation commitments. Opposition was also apparent in the OPEC states, which hoped to stall negotiations by defeating related proposals. For a detailed analysis, see Oberthür and Ott, *Kyoto-Protokoll*, 130, 205-07, 218-21; Joanna Depledge, Tracing the Origins of the Kyoto Protocol: An Article-by-Article Textual History, UN Doc. FCCC/TP/2000/2, 61-86.
[75] As a rule, developing countries and economies in transition maintain lower energy and resource efficiency standards relative to advanced industrial powers, leaving greater room for improvements at low cost.
[76] Lionel H. Goulder and Bernard Nadreau, 'International Approaches to Reducing Greenhouse Gas Emissions', in Stephen H. Schneider, Armin Rosencranz, and John O. Niles (eds.), *Climate Change Policy: A Survey* (Washington D.C.: Island Press, 2002), 122-125.
[77] On this development, see, notably, Richard Stewart, 'A New Generation of Environmental Regulation?', 30 *Capital University Law Review* (2001), 21.
[78] In response, Decision 15/CP.7, FCCC/CP/2001/13/Add.2, expressly affirms that 'the Kyoto Protocol has not created or bestowed any right, title or entitlement to emissions of any kind.'
[79] See Jonathan R. Nash, 'Too Much Market? Conflict Between Tradable Pollution Allowances and the "Polluter Pays" Principle', 24 *Harvard Environmental Law Review* (2000), 465.
[80] A survey of current mitigation projects in developing countries suggests a strong preference among investors for projects that generate a high volume of carbon credits while providing few or no development benefits, see Jane Ellis, Jan Corfee-Morlot and Harald Winkler, *Taking Stock of Progress under the Clean Development Mechanism (CDM)* (Paris: OECD, 2004), 34.
[81] Simon Marr and Sebastian Oberthür, 'Die Ergebnisse der 6. und 7. Klimakonferenz von Bonn und Marrakesch', 24 *Natur und Recht* (2002), 576.
[82] Recital 7 of the preamble to Decision 15/CP.7, FCCC/CP/2001/13/Add.2.

[83] These units all equal one metric tonne of CO_2 equivalent, calculated using global warming potentials defined by decision 2/CP.3, and are entirely fungible, acquiring an independent value based on supply and demand in the carbon market; the different units are listed in paras. 1-4 of the Annex to Decision 19/CP.7 as 'emission reduction units' (ERUs), 'certified emission reduction' (CERs), 'assigned amount units' (AAUs) and 'removal units' (RMUs).
[84] Prior to the entry into force of the Kyoto Protocol, participation in the CDM was open to all parties to the UNFCCC, see para. 3 of the Annex to Decision 17/CP.7, FCCC/CP/2001/13/Add.2.
[85] Article 3 (7) and (8) of the Kyoto Protocol and the Annex of Decision 19/CP.7, UN Doc. FCCC/CP/2001/13/Add.2
[86] Article 5 (1) of the Kyoto Protocol.
[87] See paras. 6-8 of the Annex to Decision 19/CP.7; this report will be reviewed by expert review teams (ERTs) and must, *inter alia*, contain complete inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases for all years since the base year, selected base years for synthetic greenhouse gases (HFCs, CFCs and SF6), calculation of assigned amounts and of the commitment period reserve, details of any agreements entered for joint fulfilment of commitments, information relating to LULUCF activities, and a description of national registries and national systems.
[88] These are holding accounts for the party and each authorised legal entity, cancellation accounts and a retirement account, See para. 21 of the Annex to Decision 19/CP.7, UN Doc. FCCC/CP/2001/13/Add.2.
[89] See paras. 17-22 of the Annex to Decision 19/CP.7, UN Doc. FCCC/CP/2001/13/Add.2.
[90] Article 7 (1) of the Kyoto Protocol.
[91] Farhana Yamin, 'The International Rules on the Kyoto Mechanisms', in Farhana Yamin (ed.), *Climate Change and Carbon Markets: A Handbook of Emissions Reductions Mechanisms* (London: Earthscan, 2005), 23.
[92] Listed in detail in paras. 3 (a) to (f) of the Annex to Decision 22/CP.7, FCCC/CP/2001/13/Add.2, certain criteria result in a presumption of failure to meet eligibility requirements, notably if a party has failed to submit an annual inventory within a certain timeframe, has failed to include estimates for large greenhouse gas source categories in its inventories, or has been forced to retroactively adjust its data beyond a certain level.
[93] For a detailed description of the review process, see Yamin and Depledge, *Climate Change Regime*, 353-363.
[94] As a policy instrument, emissions trading is generally credited to John H. Dales, *Pollution, Property and Prices* (Toronto: University of Toronto Press, 1968), 92-100.
[95] For an overview of emissions trading as an instrument of climate policy, see Tom Tietenberg, 'The Tradable-permits Approach to Protecting the Commons: Lessons for Climate Change', in Dieter Helm (ed.), *Climate-change Policy* (Oxford: Oxford University Press, 2005), 167, and the various contributions in Bernd Hansjürgens (ed.), *Emissions Trading for Climate Policy* (Cambridge: Cambridge University Press, 2005).
[96] Article 17 of the Kyoto Protocol.
[97] See, notably, Decision 18/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2.
[98] Decision 5/CP.6, UN Doc. FCCC/CP/2001/5, which states that 'each Party included in Annex I shall maintain, in its national registry, a commitment period reserve which should not drop below 90 per cent of the Party's assigned amount … or 100 per cent of five times its most recently reviewed inventory, whichever is the lowest.'
[99] See Articles 6 and 12 of the Kyoto Protocol, with further elaboration notably contained in Decisions 16/CP.7 and 17/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2.
[100] *Supra*, note 83.
[101] On the rationale of this "baseline-and-credit" approach Yamin and Depledge, *Climate Change Regime*, 139.
[102] For an authoritative introduction to the challenges of baseline scenario calculation, see OECD, *Emission Baselines: Estimating the Unknown* (Paris: OECD, 2000).
[103] For a discussion of this aspect, see David Freestone, 'UNFCCC, the Kyoto Protocol, and the Kyoto Mechanisms', in David Freestone and Charlotte Streck (eds.), *Legal Aspects of Implementing the Kyoto Protocol Mechanisms: Making Kyoto Work* (Oxford: Oxford University Press, 2005), 13.
[104] See Paras. 64-66 of the Annex to Decision 17/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2.
[105] See Annex B of Decision 17/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2, for the format of such PDDs.
[106] Paras. 35-52 of the Annex to Decision 17/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2.
[107] Paras. 61-63 of the Annex to Decision 17/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2.
[108] See Paras. 64-66 of the Annex to Decision 17/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2.
[109] See, notably, the specifications in Annex II to Decision 21/CP.8, UN Doc. FCCC/CP/2002/7/Add.3.
[110] Axel Michaelowa, Matthias Krey and Sonja Butzengeiger, *Clean Development Mechanism and Joint Implementation: New Instruments for Financing Renewable Energy Technologies* (Hamburg: HWWA, 2004), 3.
[111] For details, see Decision 16/CP.7, UN Doc. FCCC/CP/2001/13/Add. 2.
[112] Members of this Joint Implementation Supervisory Committee (JISC) were elected at COP/MOP1 in Montreal.
[113] See, generally, Camilla Bausch and Michael Mehling, '"Alive and Kicking": The 1st Meeting of the Parties to the Kyoto Protocol', 15 *Review of European Community and International Environmental Law* (2006) (in print).

[114] The Meeting of the Parties to the Kyoto Protocol adopted 30 decisions, while the Conference of the Parties to its parent Convention passed altogether 14 decisions; in addition, several conclusions by the Subsidiary Bodies were approved at Montreal.
[115] See the Decisions contained in FCCC/KP/CMP/2005/8/Add.1–4.
[116] Dec. 1/CMP.1, Consideration of Commitments for Subsequent Periods for Parties included in Annex I to the Convention under Article 3, paragraph 9, of the Kyoto Protocol, FCCC/KP/CMP/2005/L.8/Rev.1.
[117] Dec. 1/CP.11, Dialogue on Long-term Cooperative Action to Address Climate Change by Enhancing Implementation of the Convention, FCCC/CP/2005/5/Add.1.
[118] Ibid., recital 7 and para. 2.
[119] For a detailed analysis, see Wolfgang Sterk, Hermann E. Ott, Rie Watanabe, and Bettina Wittneben: 'The Nairobi Climate Change Summit (COP 12 - MOP 2): Taking a Deep Breath Before Negotiating Post-2012 Targets?' 4 *Journal for European Environmental & Planning Law* (2007): 139-148.
[120] IPCC, 4th Assessment Report – Synthesis Report, 2007, e.g. p. 30, 72, 73.
[121] Decision 1/CP.13, http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf#page=3.
[122] On the Bali negotiations and the negotiations leading to it and building on it, see: Camilla Bausch, Michael Mehling, „Happy end in bali-wood", FACET Commentary Nr. 1, 2008; Camilla Baush and Michael Mehling, "Current Developments - International", Carbon & Climate Law Review, Vol. 2, No. 1, 2008, p. 110-112; Camilla Bausch and Michael Mehling , "Tracking down the Future Climate Regime - An Assessment of Current Negotiations under the U.N.", Carbon & Climate Law Review, No. 1/2007, 2008, p. 4-16.
[123] Of an expected 12,000-15,000 participants, 45,000 negotiators and observers attended.
[124] Anne Chetaile, Morgane Créach, Swan Fauveaud, "Copenhagen: Political Immobility Faced With Citizen Mobilization?", Available on the Internet at: <www.gret.org/ressource/pdf/actes_copenhague_uk.pdf>.
[125] Hillary Rodham Clinton, "Remarks at the Major Economies Forum on Energy and Climate", 27 April 2009, http://www.state.gov/secretary/rm/2009a/04/122240.htm.
[126] United Nations, "Ban invites world leaders to "Unprecedented" UN Climate Change Summit & Bloomberg Annouces Climate Week in New York", 23 June 2009, http://www.sealthedeal2009.org/News_Ban-Invite-Climate-Week-in-NY.asp.
[127] General Assembly, 63rd Session Resolution 63/281 for further information see: http://www.un.org/News/Press/docs/2009/ga10830.doc.htm.
[128] Council Decision 2002/358/EC of 25 April 2002 concerning the Approval, on Behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the Joint Fulfilment of Commitments Thereunder, OJ L130/1 (2002); the ratification papers were deposited in New York on 31 May 2002, see Commission Press Release IP/02/794 of 31 May 2002.
[129] Art. 4 (1) of the Kyoto Protocol; in deciding to fulfil their commitments jointly, the Community and the Member States also decided to share responsibility for compliance with the set objectives, see Art. 4 (6) of the Kyoto Protocol.
[130] See Council Conclusions of the 2106th Council Meeting, Luxembourg, 16 June 1998, Annex I.
[131] *A Community Strategy to Limit Carbon Dioxide Emissions and to Improve Energy Efficiency*, COM(92)246 (1992).
[132] Resolution of the Council and the Representatives of the Governments of the Member States, meeting within the Council of 1 February 1993 on a Community Programme of Policy and Action in relation to the Environment and Sustainable Development – Towards Sustainability, OJ C138/1, at 42 (1993).
[133] See, notably, Council and Parliament Directive 2001/77/EC on the Promotion of Electricity Produced from Renewable Energy Sources in the Internal Electricity Market, OJ L283/33 (2001); Council and Parliament Directive 2002/91/EC on the Energy Performance of Buildings, OJ L1/65 (2003); and Council and Parliament Directive 2003/30/EC on the Promotion of the Use of Biofuels or Other Renewable Fuels for Transport OJ L123/42 (2003).
[134] Council and Parliament Directive 2003/96/EC Restructuring the Community Framework for the Taxation of Energy Products and Electricity OJ L283/51 (2003).
[135] See, most recently, Council and Parliament Decision 1230/2003/EC adopting a Multiannual Programme for Action in the Field of Energy – 'Intelligent Energy – Europe' (2003-2006) OJ L176/29 (2003).
[136] Commission Recommendations 1999/125/EC, 2000/303/EC, and 2000/304/EC on the Reduction of CO_2 Emissions from Passenger Cars (ACEA, KAMA, and JAMA, respectively) OJ L40/49 (1999), OJ L100/55 (2000), and OJ L100/57 (2000).
[137] See, most recently, Parliament and Council Decision 280/2004/EC concerning a Mechanism for Monitoring Community Greenhouse Gas Emissions and for implementing the Kyoto Protocol OJ L49/1 (2004).
[138] *EU Policies and Measures to reduce Greenhouse Gas Emissions - Towards a European Climate Change Programme (ECCP)*, COM(2000)88 final (2000).
[139] *Id*., 8.
[140] *Id*., 11-3.

[141] Council and Parliament Decision 1600/2002/EC laying down the Sixth Community Environment Action Programme, OJ L242/1 (2002).
[142] Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on Winning the Battle Against Global Climate Change COM(2005)35, 9 Feb. 2005.
[143] See the Presidency Conclusions, Brussels European Council, 25 and 26 Mar. 2004, published on the Internet at <http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/79696.pdf>, para. 32.
[144] Commission Staff Working Paper on Winning the Battle Against Global Climate Change – Background Paper SEC(2005)180, 9 Feb. 2005.
[145] COM(2005)35, n. 142 above, 4-5.
[146] *Ibid*., 6-7.
[147] *Ibid*., 7.
[148] *Ibid*., 9-10.
[149] For the first climate change programme, see EU Policies and Measures to Reduce Greenhouse Gas Emissions – Towards a European Climate Change Programme (ECCP) COM(2000)88, 8 Mar. 2000.
[150] See the fifth Environmental Action Programme, n. 132 above, 71.
[151] Another reason was the growing insight from several stalled negotiations that international emissions trading was not going to materialize anytime soon.
[152] *Climate Change – Towards an EU Post-Kyoto Strategy*, COM(98)353, at 20 (1998).
[153] *Ibid*., 25.
[154] *Green Paper on Greenhouse Gas Emissions Trading within the European Union*, COM(2000) 87 final (2000).
[155] For an overview of this development, see P. Zapfel and M. Vainio, Pathways to European Greenhouse Gas Emissions Trading – History and Misconceptions (2002); the European Union had feared emissions trading would prove ineffective in reducing greenhouse gas emissions, in particular as a result of 'hot air' arising from the inclusion of Central and Eastern European countries.
[156] See, *inter alia*, the first proposal, COM(2001)581 final (2001).
[157] 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 (hereinafter EATD), OJ L275/32 (2003).
[158] See Article 32 EATD.
[159] Under Article 3 (a) EATD, 'allowances' are defined as 'an allowance to emit one tonne of carbon dioxide equivalent during a specified period.'
[160] See Art. 249 of the Treaty Establishing the European Economic Community (EEC Treaty), 298 U.N.T.S. 3 (1957), as amended by the Treaty of Amsterdam Amending the Treaty on European Union, the Treaties Establishing the European Communities and Certain Related Acts, 37 I.L.M. 56 (1997), and now known as the Treaty Establishing the European Community (hereinafter EC Treaty).
[161] Art. 15, 16, and 21 EATD.
[162] Art. 18 and 19 EATD.
[163] Art. 20, 24 and 27 EATD.
[164] Art. 9 (1) and (3), 22 EATD.
[165] For an overview, see U. Ellinghaus, P. Ebsen and H. Schloemann, 'The EU Emissions Trading Scheme (EU ETS) – A Status Report' (2004) 1 *Journal for European Environmental & Planning Law*, 3-9; Y. Kerth, *Emissionshandel im Gemeinschaftsrecht* (Baden-Baden: Nomos, 2004), 162-71; A. Reuter and R. Busch, 'Einführung eines EU-weiten Emissionshandels – Die Richtlinie 2003/87/EG' (2004) 15 *Europäische Zeitschrift für Wirtschaftsrecht*, 39-43.
[166] Art. 4 of Council Dir. 2003/87/EC; Art. 3 (e) defines operators as 'any person who operates or controls an installation or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of the installation has been delegated'; installations, in turn, are described in Art. 3 (e) as 'a stationary technical unit where one or more activities listed in Annex I are carried out and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution.'
[167] See Annex I of Council Dir. 2003/87/EC, with threshold values for combustion installations (rated thermal input exceeding 20 MW, except hazardous or municipal waste installations), the production of pig iron or steel (capacity exceeding 2,5 tonnes per hour), the production of cement clinker in rotary kilns (production capacity exceeding 500 tonnes per day) or lime in rotary kilns (production capacity exceeding 50 tonnes per day) or in other furnaces (production capacity exceeding 50 tonnes per day), the manufacture of glass (melting capacity exceeding 20 tonnes per day), the manufacture of ceramic products (production capacity exceeding 75 tonnes per day, or with a kiln capacity exceeding 4 m3 and with a setting density per kiln exceeding 300 kg/m3, and the production of paper and board (production capacity exceeding 20 tonnes per day).

[168] Annex II of Council Dir. 2003/87/EC, lists all six greenhouse gases, but only CO2 emissions are relevant for the covered activities, see Annex I.
[169] 'Opt-in', Art. 24 (1) of Council Dir. 2003/87/EC.
[170] 'Opt-out', Art. 27 of Council Dir. 2003/87/EC.
[171] Art. 28 (1) of Council Dir. 2003/87/EC.
[172] Art. 5 of Council Dir. 2003/87/EC.
[173] Commission Decision establishing Guidelines for the Monitoring and Reporting of Greenhouse Gas Emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council, COM(2004)130, 29 Jan. 2004.
[174] Art. 7 of Council Dir. 2003/87/ECe.
[175] Council Directive 96/61/EC concerning Integrated Pollution Prevention and Control [1996] OJ L257/26.
[176] Art. 8 of Council Dir. 2003/87/EC.
[177] Art. 6 (2) of Council Dir. 2003/87/EC.
[178] Art. 3 (a) of Council Dir. 2003/87/EC, defines allowance as 'an allowance to emit one tonne of carbon dioxide equivalent during a specified period, which shall be valid only for the purposes of meeting the requirements of this Directive and shall be transferable in accordance with the provisions of this Directive.'
[179] Art. 9 (1) of Council Dir. 2003/87/EC.
[180] Art. 10 of Council Dir. 2003/87/EC.
[181] Annex II of Council Dir. 2003/87/EC.
[182] Communication from the Commission on Guidance to Assist Member States in the Implementation of the Criteria listed in Annex III to Directive 2003/87/EC establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community and amending Council Directive 96/61/EC, and on the Circumstances under which Force Majeure is demonstrated, COM(2003)830, 7 Jan. 2004.
[183] See below, III. A.iv.
[184] Art. 9 (2) of Council Dir. 2003/87/EC; according to Art. 23 (1), this committee is the same established under Art. 8 of Council Decision 93/389/EEC for a Monitoring Mechanism of Community CO2 and other Greenhouse Gas Emissions [1993] OJ L167/31.
[185] Art. 9 (1) of Council Dir. 2003/87/EC. The accession countries joining the European Union on 1 May 2004 had to finalize and submit their allocation plans by the date of accession.
[186] Art. 9 (3) of Council Dir. 2003/87/EC.
[187] Art. 11 (1) and (2) of Council Dir. 2003/87/EC.
[188] Art. 11 (1) of Council Dir. 2003/87/EC.
[189] Art. 13 (1), (2) and (3) of Council Dir. 2003/87/EC, with mandatory replacement from the 3rd allocation period onward; banking, as such, is not provided for, but the effect will be the same.
[190] Art. 6 (2) and 12 (3) of Council Dir. 2003/87/EC.
[191] Art. 16 (3) and (4) of Council Dir. 2003/87/EC.
[192] 'Naming and Shaming', Art. 16 (2) of Council Dir. 2003/87/EC.
[193] Art. 12 (1) and (2) of Council Dir. 2003/87/EC.
[194] For transactions between persons in the Community and persons in third countries, the allowances from the latter must have been recognized through an agreement in accordance with Art. 25 of Council Dir. 2003/87/EC.
[195] Proposal for a Directive amending the Directive establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community, in respect of the Kyoto Protocol's Project Mechanisms COM(2003)403, 23 July 2003; the proposal was adopted in the Council by qualified majority on 13 September 2004, see *ENDS Environment Daily* of 14 Sep. 2004.
[196] Art. 19 (1) of Council Dir. 2003/87/EC.
[197] Art. 19 (2) of Council Dir. 2003/87/EC.
[198] Art. 20 of Council Dir. 2003/87/EC.
[199] Draft Commission Regulation for a Standardised and Secured System of Registries pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Decision 280/2004/EC of the European Parliament and of the Council, agreed by the Member States in the Climate Change Committee on 24 June 2004.
[200] This transaction log will be operated and maintained by the Secretariat of the United Nations Framework Convention on Climate Change.
[201] Art. 3 (1) of the Draft Commission Regulation, n. 187 above.
[202] Art. 4 of the Draft Commission Regulation, n. 187 above.
[203] See Arts. 12 to 23 of the Draft Commission, n. 187 above.
[204] Arts. 49 and 74 of the Draft Commission Regulation, n. 197 above
[205] European Commission, The EU Emissions Trading Scheme – How to Develop a National Allocation Plan, Non-Paper, <http://europa.eu.int/comm/environment/climat/pdf/030401nonpaper.pdf>, at 14.
[206] The allocation process is governed by Arts. 9, 10 and 11 EATD, the criteria in Annex III, and detailed guidelines contained in the Communication from the Commission on Guidance to Assist Member States in the Im-

plementation of the Criteria listed in Annex III to Directive 2003/87/EC establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community and amending Council Directive 96/61/EC, and on the Circumstances under which Force Majeure is demonstrated, COM(2003)830 (2004); it will occur largely free of charge (sometimes labelled "grandfathering"), but may include up to five per cent of auctioned allowances in the first period and ten per cent thereafter, see Art. 10 EATD.

[207] See Article 9 (1) EATD; for accession states, this deadline was 1 May 2004.

[208] These were Austria, Denmark, Finland, Germany and Ireland.

[209] European Commission, Press Release IP/04/862 of 7 July 2004.

[210] European Commission, Press Release IP/05/9 of 6 Jan. 2005.

[211] European Commission, Press Release IP/05/762 of 20 June 2005.

[212] See Article 43 of the EC Treaty.

[213] See, generally, Michael Rodi, 'Legal Aspects of the European Emissions Trading Scheme', in Bernd Hansjürgens (ed.), *Emissions Trading for Climate Policy* (Cambridge: Cambridge University Press, 2005), 177-198.

[214] Criterion 5 in Annex III of the EATD, which explicitly refers to Articles 87 and 88 of the EC Treaty.

[215] Non-Paper, *supra*, note 205, at 1-2.

[216] Under Article 11 (3) EATD, allocation decisions "shall be in conformity with the requirements of the Treaty, in particular Articles 87 and 88 thereof."

[217] Commission Guidelines on State Aid for Environmental Protection, OJ C37/3 (2001).

[218] State Aid No. N 416/2001 – United Kingdom Emission Trading Scheme C(2001)3739fin, 28 Nov. 2001, 9-12.

[219] Letter of 17 March 2004, ENV C2/PV/amh/D(2004)420149.

[220] See generally Foundation for International Environmental Law and Development (FIELD), *Designing Options for Implementing an Emissions Trading Regime for Greenhouse Gases in the EC* 29 (London: Field, 2000).

[221] European Commission, Press Release IP/04/862 of 7 July 2004.

[222] Communication from the Commission to the Council and to the European Parliament on Commission Decisions of 20 October 2004 concerning National Allocation Plans for the Allocation of Greenhouse Gas Emission Allowances of Belgium, Estonia, Finland, France, Latvia, Luxembourg, Portugal, and the Slovak Republic in accordance with Directive 2003/87/EC COM(2004)681, 5 (2004).

[223] Council and Parliament Directive 2004/101/EC 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 (hereinafter Linking Directive), OJ L338/18 (2004).

[224] Article 30 (2) (d) EATD.

[225] Article 30 (3) EATD.

[226] *Ibid.* A similar passage can be found in recital 19 of the preamble of the EATD.

[227] Commission Proposal for a Directive amending the Directive establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community, in respect of the Kyoto Protocol's Project Mechanisms COM(2003)403 (2003).

[228] European Commission, Press Release IP/04/505 of 20 Apr. 2004; on the amendments, see Report on the Proposal for a European Parliament and Council Directive amending the Directive establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community, in respect of the Kyoto Protocol's project mechanisms of 17 March 2004, European Parliament Doc. Nr. A5-0154/2004. They concerned: the starting point of credit conversion, which the European Parliament wanted to coincide with the onset of emissions trading on 1 Jan. 2005; the acceptability of large hydroelectricity production projects; and the minimum share of efforts taken at national level by the Member States.

[229] COM(2003)403, *supra*, note 227, at 4-7. In its legislative Proposal, the Commission forecast a significant reduction in the price of individual allowances from € 26 to under € 13, and annual savings of € 700 million for participating operators in the enlarged Community.

[230] This has prompted many environmental NGOs to openly criticize or even reject the Linking Directive; see, e.g., Climate Action Network, The Linking Directive: Member States Must now Tighten a Weak European Deal, Press Release of 20 Apr. 2004.

[231] See the Proposal for Article 11(bis)(2), contained in COM(2003)403, *supra*, note 227, Article 1.

[232] Article 1 (1) of the Linking Directive.

[233] *Ibid*., Article 1(2).

[234] Article 11 (a) (2)of the amended EATD, as contained in Article 1 (2) of the Linking Directive.

[235] On this 'fungibility' of units, see Lefevere, *supra*, note **Fehler! Textmarke nicht definiert.**, at 131.

[236] Articles 11 (a) (3) (a) of the amended EATD, as contained in Article 1 (2) of the Linking Directive.

[237] Jürgen Lefevere, 'Linking Emissions Trading Schemes: The EU ETS and the "Linking Directive"', in David Freestone and Charlotte Streck (eds.), *Legal Aspects of Implementing the Kyoto Protocol Mechanisms: Making Kyoto Work* (Oxford: Oxford University Press, 2005), 511-36, at 526-27.

[238] On this issue, see Lefevere, *supra*, note **Fehler! Textmarke nicht definiert.**, at 134.
[239] Article 11 (b) (2) of the amended EATD, as contained in Article 1 (2) of the Linking Directive.
[240] Articles 11(b)(3) and (4), of the amended EATD, as contained in Article 1 (2) of the Linking Directive. This possibility elapses on 31 Dec. 2012.
[241] Article 11 (b) (3) of the amended EATD, as contained in Article 1 (2) of the Linking Directive.
[242] Article 11 (b) (4) of the amended EATD, as contained in Article 1 (2) of the Linking Directive.
[243] Article 11 (b) (5) of the amended EATD, as contained in Article 1 (2) of the Linking Directive.
[244] *Ibid*., with reference to WCD, Dams and Development – A New Framework for Decision-Making (2000).
[245] Article 17 of the amended EATD, as contained in Article 1 (3) of the Linking Directive, with reference to Council Directive 2003/4/EC on Public Access to Environmental Information and Repealing Council Directive 90/313/EEC, OJ L41/26 (2003).
[246] Article 21 (a) of the amended EATD, as contained in Article 1 (6) of the Linking Directive.
[247] Article 30 (2) of the amended EATD, as contained in Article 1 (8) (b) of the Linking Directive.
[248] Article 30 (2) (l) to (o) of the amended EATD, as contained in Article 1 (8) (b) of the Linking Directive.
[249] Article 30 (3) of the amended EATD, as contained in Article 1 (8) (c) of the Linking Directive.
[250] Lefevere, *supra*, note **Fehler! Textmarke nicht definiert.**, at 129.
[251] Andrew Kohut et al., "Fewer Americans See Solid Evidence of Global Warming," The Pew Center, 22 October 2009, available on the Internet at < http://people-press.org/report/556/global-warming>.
[252] "Voters Give Mixed Reviews to Global Warming Legislation, But 56% Don't Want To Pay For It," 27 April 2010, Rasmussen Reports, available on the Internet at < http://www.rasmussenreports.com/public_content/politics/current_events/environment_energy/voters_give_mixed_reviews_to_global_warming_legislation_but_56_don_t_want_to_pay_for_it>.
[253] S. Kull et al., *Americans on Climate Change. Poll by the Program on International Policy Attitudes (PIPA) and Knowledge Networks (KN)* (2005).
[254] It had declared that the United States would not take on any mandatory greenhouse gas emissions unless the treaty under which this was agreed to, included similar mandatory reductions for developing countries in the same period: "Resolved, That it is the sense of the Senate that --
1. the United States should not be a signatory to any protocol to, or other agreement regarding, the United Nations Framework Convention on Climate Change of 1992, at negotiations in Kyoto in December 1997, or thereafter, which would --
(A) mandate new commitments to limit or reduce greenhouse gas emissions for the Annex I Parties, unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period […]", Senate Resolution 98, 25 July 1997.
[255] Senate Resolution 114, part on Energy Policy Act passed by the U.S. Senate on 28 June 2005.
[256] *Green Paper on Greenhouse Gas Emissions Trading within the European Union*, COM(2000) 87 final (2000).
[257] 42 U.S.C. § 7521(a)(1) ("CAA").
[258] Fed. Reg. 52,922, 52,922-23. 8 Sept. 2003.
[259] EPA, *EPA Denies Petition to Regulate Greenhouse Gas Emissions from Motor Vehicles*, Press Release of 28 Aug. 2003, <www.epa.gov/newsroom/newsreleases.htm> (accessed 8 Apr. 2006).
[260] 415 F.3d 50 (D.C. Cir. 2005).
[261] Sidley Austin Brown and Wood L.L.P., *Environmental Advisory*, Oct. 2005, <www.sidley.com/db30/cgibin/pubs/EnvironmentalAdvisorySept2805.pdf> (accessed 8 Apr. 2006).
[262] 42 U.S.C. § 7521(a)(1).
[263] J. Adler, *States' Hot Suits AGs Seek to Force the Administration's Hand on Global Warming*, <www.nationalreview.com/adler/adler043003.asp> (accessed 20 Jan. 2006).
[264] Details on the Accord are available on the Internet at <http://www.midwesternaccord.org/index.html>.

Emissions Trading in the European Union;
History, Development and Review of the EU ETS

Jill Duggan

July 2010

Outline

- Building up to trading
  - Early decisions
- Phase I – the pilot phase
  - Quickly learning
- Phase II consolidating experience
  - Getting comfortable with trading
- Post 2012 – putting lessons into practice

1998 – 2001- Why Emissions Trading?

- December 1997 – 3rd COP and Kyoto Protocol – enshrined the concept of emissions trading as a central policy tool to tackle climate change
- 3 potential approaches for Europe
  - Top down implementation of UN scheme – needing agreement of 180+ countries
  - Bottom up – member state domestic systems – could result in incompatibility between European states
  - Regional level system at Europe level
- Debate about the role of emissions trading
  - To reduce emissions?
  - Cheap buy out to comply with international commitments?
- US experience and preference and active engagement in EU debate
- But failure of progress in the UN prompted Europe to move alone

Early interest – late 1990s and early 2000s

- Discussions prompted further investigation and initiatives
  - The Emissions Trading Group in UK
  - Parliamentary Commission in Sweden and Norway
  - Danish energy sector reform
- Discussions on
  - Upstream vs downstream
  - Allowances vs credits
  - Auctioning vs grandfathering
  - Absolute vs relative targets
- Danish CO2 quota system in the power sector
- BP pilot trading extended to cover 150 business units globally
- UK Emissions Trading Scheme

Caused opponents to rethink their positions on trading – national stakeholder group in Germany

Separate systems or linked systems

- UK pilot trading starting in 2002 pushed carbon markets up the agenda
- But small states were concerned whether domestic systems viable
- 2000 Green paper on GHG emissions trading within the EU
  - Emphasised middle ground – between complete harmonisation and completely separate systems
  - Emphasised competition and state aid policy for allocation choices
- Multi stakeholder working group established in 2000 and reported in 2001 that trading system should be set up as soon as possible
- 2001 European Commission adopted a proposal for a directive for EU wide trading in GHG permits to be mandatory for certain energy intensive sectors from 2005

Europe going out in front - The first European proposal

2000 COP – lack of progress on how to implement flexible mechanisms
March 2001 – Bush Administration will not submit KP for ratification

First European proposal envisaged

- Consistent scope
- Initial allocation decisions to individual states
- Grandfathering for first phase
- National allocation plans
- Financial penalties for covered entities
- Initial learning phase proposed – 2005-2007
- Followed by KP phase 2008-2012
- JI and CDM credits excepted
- Future linking based on mutual recognition

The Issues

- Absolute vs relative targets
- Grandfather vs benchmarks
- Free allocation vs auctioning
- Broad medium or narrow scope
- Banking and borrowing
- New entrant reserves, closure rules
- Banking and borrowing
- Use of credits
- Penalties
- Price caps and collars

Early challenges

- 10 new member states joining the EU in 2004
- 21 official languages
- Different industrial process – eg electric arc furnaces and blast furnaces for steel production
- Poor data at installation level
- Lack of capacity amongst administrators
- Lack of infrastructure – accreditation process for verifiers, technical data
- Around 10,000 installations to be covered
- Strong lobbying from some industries
- Impossible timetable!!

EU Emissions Trading Scheme Phases I & II

- Covers CO_2 emissions from combustion processes (approx 42% of EU GHG emissions) Aviation covered from 2012.
- Phase I – 2005-2007 - 'learning phase'
- Phase II – 2008-2012 - Kyoto Commitment Period
- 1 European Union Allowance (EUA) = 1metric tonne of CO_2 e
- Allowances freely tradable throughout 27 Member States
- Most allowances allocated free - range of methods, including historical emissions, projected emissions, sector benchmarks etc
- Low levels of auctioning – Phase II ~ 3% across EU
- 'Limited' use of Kyoto project credits

2005 Pilot Trading begins

- Timetable and political pressures had led to some hurried decisions
- Lack of installation level data made allocation decisions difficult
- Member states had to produce National Allocation Plans showing
  - how they had set their cap,
  - how they had allocated emissions allowances,
  - how they had interpreted scope
- Not allowed to allocate at more than need or *ex poste*
- National Allocation Plans were submitted for approval from Commission
- No member states were ready on 1st January – Denmark first in February
- Plans were submitted, amended, approved and allowances allocated throughout 2005 and early 2006

The First National Allocation Plans

- 25 member states interpreted the directive in 25 different ways
- Scope of inclusion varied – interpreted as broad, medium or narrow (the Commission rejected narrow)
- Rules for new entrants and closures varied
- National Allocation Plans lacked transparency – difficult to work out assumptions states had made in projecting 'need'
- Commission reduced overall allocation for first phase by ~ 220 million allowances
- Industry were concerned by the differences in treatment by different states

The first reconciliation

- Substantial excess of allowances
- Subsequent research points to
  - Real abatement
  - But also overallocation

Causes?

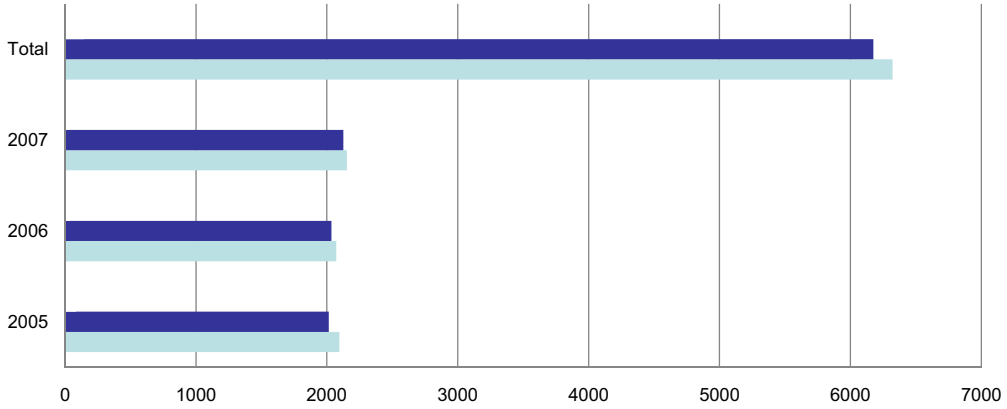
Lack of data at an installation level

Free allocation – leads to lobbying

Lack of transparency in Member States NAPs – led to competitive concerns WITHIN the EU

Competitiveness concerns with other global producers

Phase I – emissions vs allocation



	2005	2006	2007	Total
Difference	82,428738	36,112966	27,565721	146,107425
Emissions	2014,01398	2035,64936	2125,55779	6175,22113
Allocation	2096,44272	2071,76232	2153,12351	6321,32855

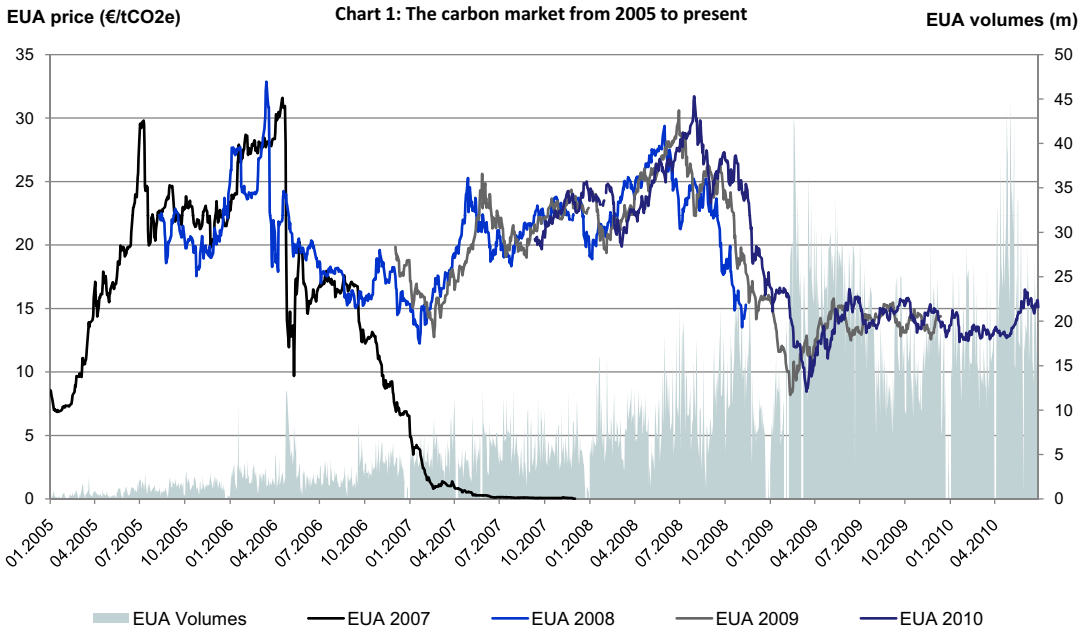
And the response – changes for Phase II

- No change to the legislation – so changes had to be voluntarily agreed
- Harmonisation on scope and agreement on definitions of activities for inclusion
  - Meant some member states who had adopted a very broad scope for phase I could remove installations from the system
  - But overall around 50 million more tonnes of CO2 were included in the scheme as states such as UK and Germany broadened inclusion
- Small installations – agreement on how to remove the smallest – eg boilers in universities and hospitals
- Limits on the use of credits
- Greater harmonisation on rules
- BIGGEST change was the availability of verified emissions data for each installation for 2005 – enabled Member States and the Commission to provide SCARCITY – necessary for a functioning market

Phase II – the impact of the new NAPs

- Relatively stable carbon price
- Certainty for industry
- Greater ambition
- Paved the way for more substantive changes to the Directive for beyond 2012

Price and volumes to date



National Allocation Plans
Phase I(2005-7)& Phase II(2008-12)

Phase I

- Lack of data on which to base plans – caps based on Business as Usual projections
- Led to over-allocation across Phase I
- Delayed start by some countries
- Poor handling of reconciliation data – different countries information reached market at different times – led to price volatility

Phase II

- 2005 verified emissions data on which to base NAPs
- More challenging Member State peer review process in submitting plans to Commission
- Commission able to challenge plans against actual emissions
- All reconciliation data published on2 April each year

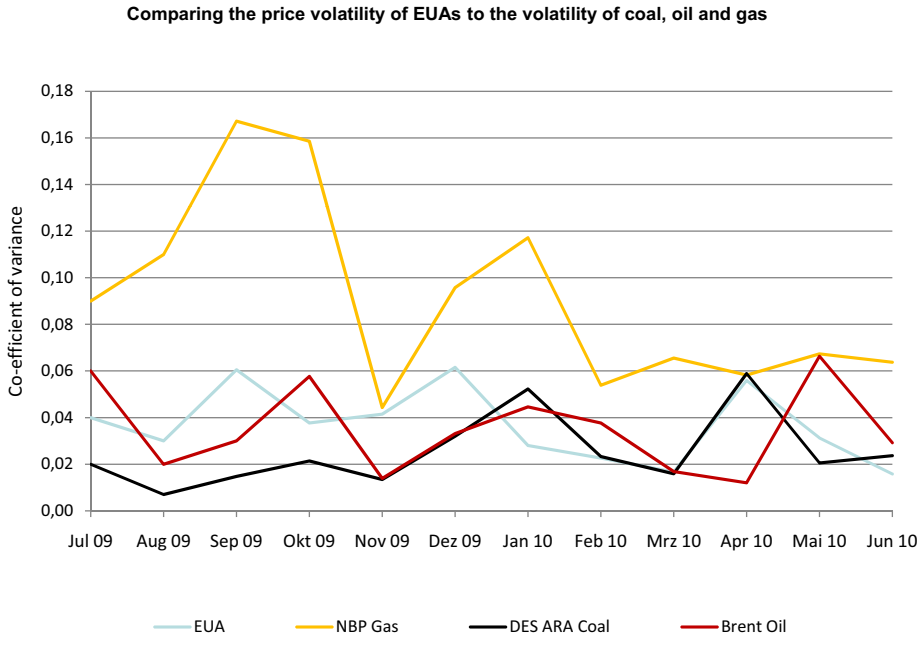
Allocation – Phase II

- Mainly grandfathered but more benchmarks used – eg UK power sector
- Selling/auctioning ~3% across EU
- New Entrant Reserve set at MS level,
- Access to CDM set at installation level by MSs as part of NAP – and has been subsequently tightened

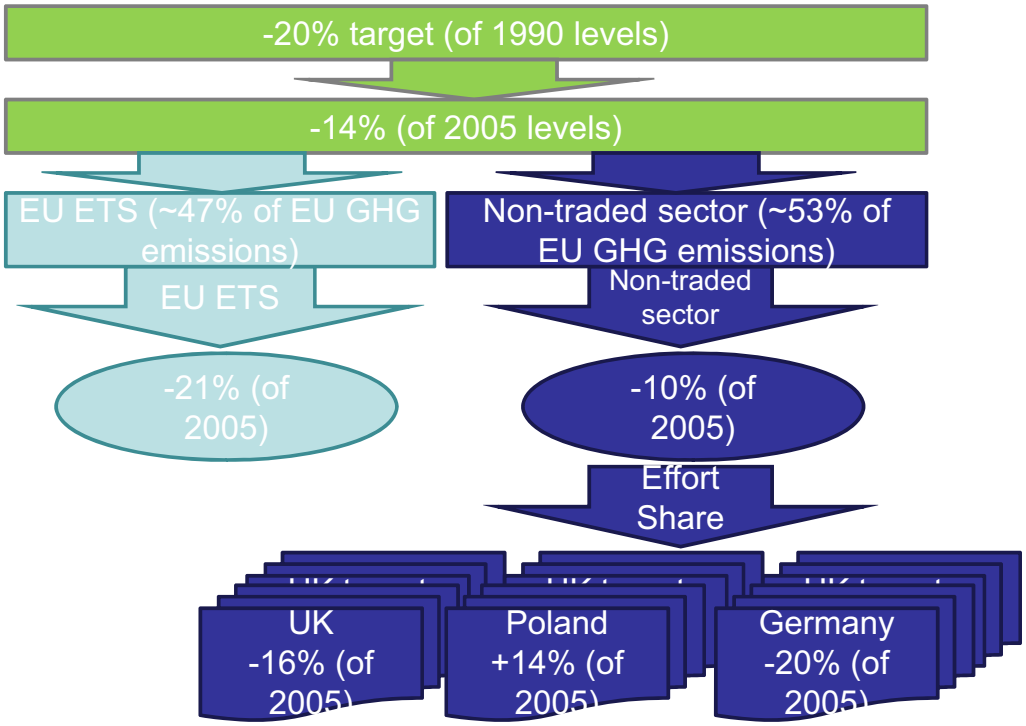
What's happened so far in Phase II

- European Commission assessed Member State plans using 2005 verified emissions data – created more scarcity (though recession has had an effect)
- EU effort 124mtCO_2e/6% a year below 2005 emissions
- Price has been more stable
- Greater acceptance on the need for centralisation and harmonisation – and for a greater use of auctioning

How volatile is the carbon price?



EU 2020 Climate and Energy Package

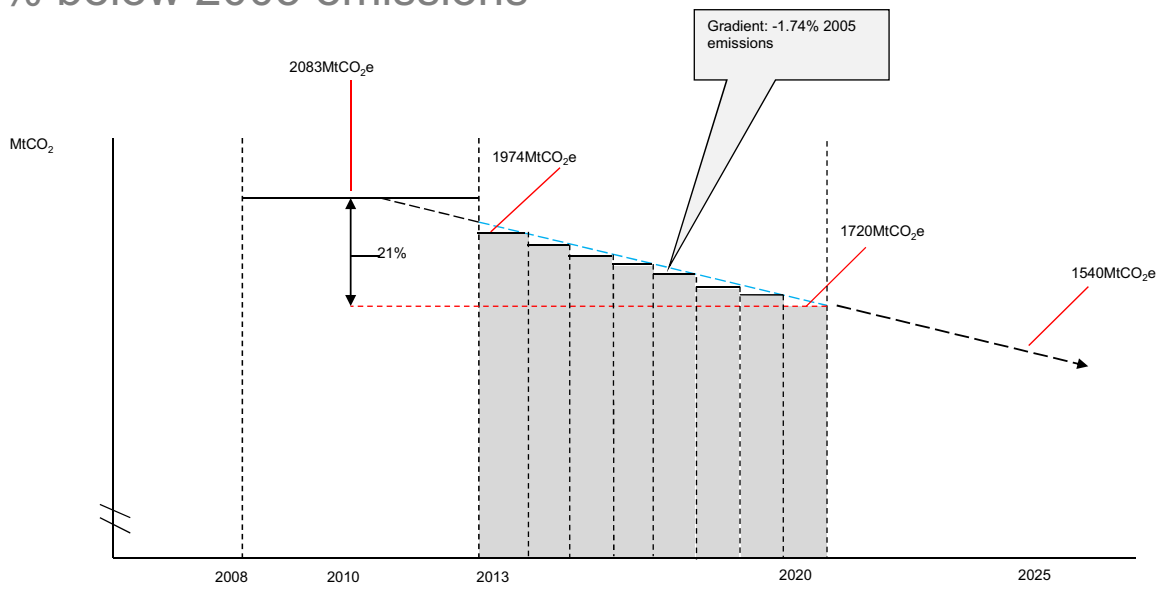


ETS Lessons learned – Phase III from 2013

- Increased harmonisation
  - Centrally set cap – no more NAPs
  - Community wide rules for free allocation. Sectors share of allocation will be in line with 2005-7 verified emissions
- Increase in auctioning – greater stimulus for low-carbon investors.
- Tighter limits on use of project credits in ETS – must be less than 50% of absolute reductions
- NO MORE ALLOCATION PLANS!

Overall Cap and Reduction Trajectory

Central cap – linear decrease from 2008-12 of 1.74% in average annual emissions. 1720 $mtCO_2e$ in 2020 = 21% below 2005 emissions



Allocation – Phase III

- Large increase in Auctioning >60% by 2020
  - 100% for power sector
  - 20% in 2013, rising to 70% in 2020, reaching 100% by 2027 for industry not exposed to carbon leakage
  - 100% free allocation for sectors exposed to risk of carbon leakage
- All free allocation is according to ambitious Benchmarks
- NER set centrally, 5% of cap
- Access to CDM across Phases II & III limited to 50% effort
  - Limited additional access to CDM in Phase III. Phase II access can be carried forward. New access will be distributed in spirit of harmonisation.

Carbon Leakage

Criteria in the Directive are based on increased costs as result of ETS and extra-EU trade intensity.

- 5% cost increase and 10% trade intensity; or
- 30% cost increase; or
- 30% trade intensity.

Sectors at risk of carbon leakage will receive free allocation equivalent to 100% of their benchmark.

All free allocation will be reviewed in light of international agreement

Successes and continuing issue

- Greater acceptance of trading and action
- Seen as a positive incentive to help build new industry and markets
- Political nervousness has decreased – and ambition increased
- Emissions Trading works – Point Carbon Survey of participants in 2006 found 15% took future cost of carbon into account for investments
  - By 2007 this had risen to 65%
- 27 Member States have put in place the institutional framework for Trading and now have 3 years verified data
- 3 from outside the EU have linked to EU ETS – Norway, Iceland and Lichtenstein
- EU business has gained experience that will help them in the low carbon economy

Allocating Allowances in an Emissions Trading System: Options, Implications and Experience

Jill Duggan

July 2010

Free allocation, auction or sale

- Emissions trading requires entities to submit allowances or credits equal to their emissions on a regular basis
- Economic theory value of the allowance the same if it is allocated for free or sold –value is dependent on the scarcity and demand in the market
- Important implications in choosing whether and how to allocate and to whom
- Auctioning most efficient system when ‘price discovery’ is required and where the majority of allowances are for sale in this way
- Small proportion of allowances are to be sold, may be better to sell them into the market in a constant stream rather than through auctions
- Where free allocation is adopted there are a number of consequences to be considered.

Auctioning

- Well designed auctions can offer particular advantages in emissions trading systems
  - Most efficient – firms buy what they need – none of the downsides of free allocation
  - Reveal the market price – if a sufficient proportion are being auctioned – but question the need for auctions if a small proportion are being sold
  - They create behavioural changes faster and more efficiently than free allocation
  - Provide a large and very addictive income stream!

- For more information on specific designs look at the websites for
  - RGGI
  - EU ETS – and currently within Member States

Issues to consider for auctioning

- Important to ensure
  - Access – small emitters may need to use auctions – they may not be buying the quantities that brokers will deal with
  - No opportunities for gaming or manipulation – easier to ensure in bigger markets where it would be very expensive and more obvious if a significant proportion of allowances were being withheld or bought in suspicious ways – 625 million allowances traded daily in ETS
  - Does not create price shocks – regular and frequent auctions better than an annual auction
  - Well regulated – eg Market Monitor for RGGI http://www.rggi.org/co2-auctions/market_monitor and in the EU there is a requirement that:
    - All auction platforms must be regulated markets as defined by the Markets in Financial Instruments Directive (MiFID).

Case study – a UK approach

- The UK's auction model for Phase II uses a number of intermediaries (known as 'Primary Participants), to collect and submit bids to the auction on behalf of any EU ETS participant who wishes to bid, subject to certain checks. These bidders are known as 'indirect bidders'. Currently there are seven intermediaries. Although most are investment banks, the role can be fulfilled by other organisations subject to their ability to meet certain criteria. As well as submitting bids on behalf of indirect bidders, Primary Participants can submit bids on their own account.

UK case study

- Primary Participants must meet certain criteria to be approved by government to perform the role. One such obligation is to ensure that information handled on behalf of indirect bidders is kept entirely separate from Primary Participants' own-account information. Auctioning regulations contain punitive clauses for abuse of information.
- Amendments to auctioning legislation (owned by HMT) introduced an incentive fee for Primary Participants that is directly linked to the number of successful indirect bids they submit to the auction. In this way, Primary Participants are encouraged to bring higher numbers of bidders to auction, increasing participation and therefore the chances of a better clearing price.

Sale

- One of the downsides of auctions is that they can create shocks to the market if a large number of allowances are auctioned at any one time.
- They may also be vulnerable to other external economic or financial factors that cannot be controlled by the auctioneers – for example if there is a sudden downturn in economic activity.
- Where a relatively small proportion of allowances is for sale it may be less disruptive to place them on the market through brokers for sale in a more continuous stream – eg German approach for Phase II. This will not create shocks to the market, will provide more consistent and predictable returns – as allowances are sold at high and low prices…

- So why not sell in this way all the time – because one of the important functions of the auction is reveal the price of carbon….

Free allocation

- Where there are concerns about the competitiveness impacts of introducing a carbon price
- Political nervousness
- Industry lobbying
- *Ex ante* or *ex poste*
  - *Ex poste* – or further adjustments make it more difficult to have a smooth functioning market
  - *Ex ante* – free allocation is not a perfect science – Ex ante allocation prevents market manipulation BUT means that some entities will be over or under allocated
- Historical emissions – grandfathering
- Benchmarks

Issues with free allocation to installations

- Free allocation based on historical emissions provides a perverse incentive – high emissions gain more allocation
- Free allocation is not a perfect science – *ex ante* allocation risks winners and losers
- The prospect of free allocation creates a strong lobby – firms want allowances in line or better than their competitors – and will lobby to get these – and this can undermine the cap
- Some sectors can gain windfall profits from free allocation - passing on the marginal cost of allowances to consumer
- State aid issues can arise where there is not a harmonised approach across states – so can also create competitive distortions

Dealing with Carbon Leakage

Europe's proposals for sectors at risk of carbon leakage:

- Sectors were assessed on the basis of two quantitative criteria (EU ETS related cost increase as a proportion of GVA and non-EU trade intensity) and three qualitative criteria (abatement potential, market structure, profit margins).

- Sectors which exceeded the quantitative thresholds in the Directive were deemed to be at risk. The thresholds are:
  - combined threshold of >5% cost increase and > 10% non-EU trade intensity
  - single cost increase threshold of > 30%
  - single non-EU trade intensity threshold of >30%

- 164 sectors were deemed to be at risk in the European Commission's assessment. This does not mean that they will get a free allocation.

Allocation in EU ETS Phase I – with UK example

- Free allocation of at least 95% of allowances (though in theory allowances should be less than need)
- UK used 5 years data – 1998-2003 dropping the lowest year and then averaging.
- Top down cap setting, bottom up share setting. So sectors allocated a proportion of cap and installations allocation on the basis of their historic emissions. Huge number of sectors (59) due to other policies and lobbying
- New entrant reserve deducted from the sector allocation (as most new plant will be extension of existing or through existing actors)
- Closure rules – difficult and complicated to apply in practice but lose allocation for future years
- Debate on no new entrant and no closure rule
- Large number of small installations may have led to the 'overallocation' in Phase I because of 'rounding up'

Allocation in Phase II

- Could auction or sell up to 10% of allocation –
- Overall cap and country caps had to lead to Kyoto compliance – and were based on verified emissions data from Phase I
- National Allocation Plan templates – greater consistency and transparency
- Greater understanding and therefore more experienced critique by Member States of each others plans
- Confidence that reducing emissions was not as costly as initially feared
- Greater discussion and harmonisation amongst Member States
- Concern over windfall profits for power generators and some industrial sectors
- Reassurance that the public recognition and awareness was low!

Phase II allocation – UK example

- UK opted to auction 7% plus excess from New Entrants and Closures
- In the UK reduced the number of sectors to 19
- Introduced benchmarking for the large power supply plants
- Offered benchmarking to other sectors who could provide the data to justify benchmarks – brewing sector interested but couldn't provide the data
- Sought to get greater harmonisation across Europe – so created definitions for voluntary adoption for certain activities – so scope at least was covered
- Small installations – proposed changes to aggregation rule to allow smallest (universities, hospitals) to opt out

Free allocation rules in EU post 2012

The revised EU ETS Directive sets out the principles by which free EU allowances will be distributed to installations on a harmonised EU-wide basis. These principles are that:

- the allocation should be *ex-ante* i.e. based on historic data and not adjusted ex-post;
- the allocation should give incentives to reduce emissions and take into account efficient techniques such as high efficiency Combined Heat and Power (CHP);
- the allocation should be calculated for final products rather than inputs to maximise emissions reductions and;
- the starting point shall be the average performance of the 10% most efficient installations in a sector or sub-sector in the EU in 2007-2008.

The final EU-wide allocation rules are due to be agreed by 31 December 2010.

Free allocation rules
Allocation methodologies

Allocations will be determined through a hierarchy approach:

Different sectors will be assessed as to what is feasible – if product benchmarks are not feasible the fallback allocation methodologies will apply.

Benchmarks are a transitional allocation approach prior to the adoption of auctioning.

Developing benchmarks is very data intensive.

Benchmark negotiations can be very fraught reflecting different industrial process, different development and geo political context.

The EU has developed 60 product benchmarks – which need to be appropriate for new entrants as well as existing entities.

Free allocation rules
New entrants

- 5% of EU cap set aside for new entrants in an EU-wide reserve (Article 10a (7))
- New entrants are defined as:
  - new builds which obtain a GHG permit for the *first time* after 30 June 2011.
  - "significant extensions" after 30 June 2010
- European Commission shall adopt harmonised rules for "significant extension" to ensure harmonised implementation across Member States. The revised Directive sets basis for this definition (Recital 16):
  - "significant extension" should, wherever appropriate, be defined as an extension by at least 10% of the installation's existing installed capacity or a substantial increase in the emissions of the installation linked to the increase in the installed capacity.
- No free allocation shall be made in respect of any electricity produced by new entrants Article10a (7).
- Allowances which remain in the new entrants' reserve in 2020 should be auctioned Article10a (7).

Summary

- Free allocation is an introductory measure whilst transitioning to auctioning
- It recognises political nervousness, the danger of unintended consequences, and concern over taking a carbon price when competitors have not
- Grandfathering based on historical emissions is a second or third best option – but was initially adopted because of lack of time to develop benchmarks
- Benchmarks are difficult and time consuming to develop – would be better to move to auctioning if can reassure on competitiveness
- Auctioning provides an efficient system, and an income stream. Even if the price is low the income may be significant – see RGGI
- If only a small proportion of allowances are being disposed of it may be better to sell them through the market – less administratively complex and no shocks to the market.

Nederlandse Emissieautoriteit
Dutch Emissions Authority

Introduction to the Dutch Emissions Authority

Basics of Emission trading

Harm van de Wetering

Programme

9.00 Basics of Emission trading – Harm van de Wetering

9.25 Validation and Permits – Ronald Hof

9.50 Compliance and Enforcement – Bas Bougie/
Rudolf van Nuissenburg

10.15 Coffee and tea break

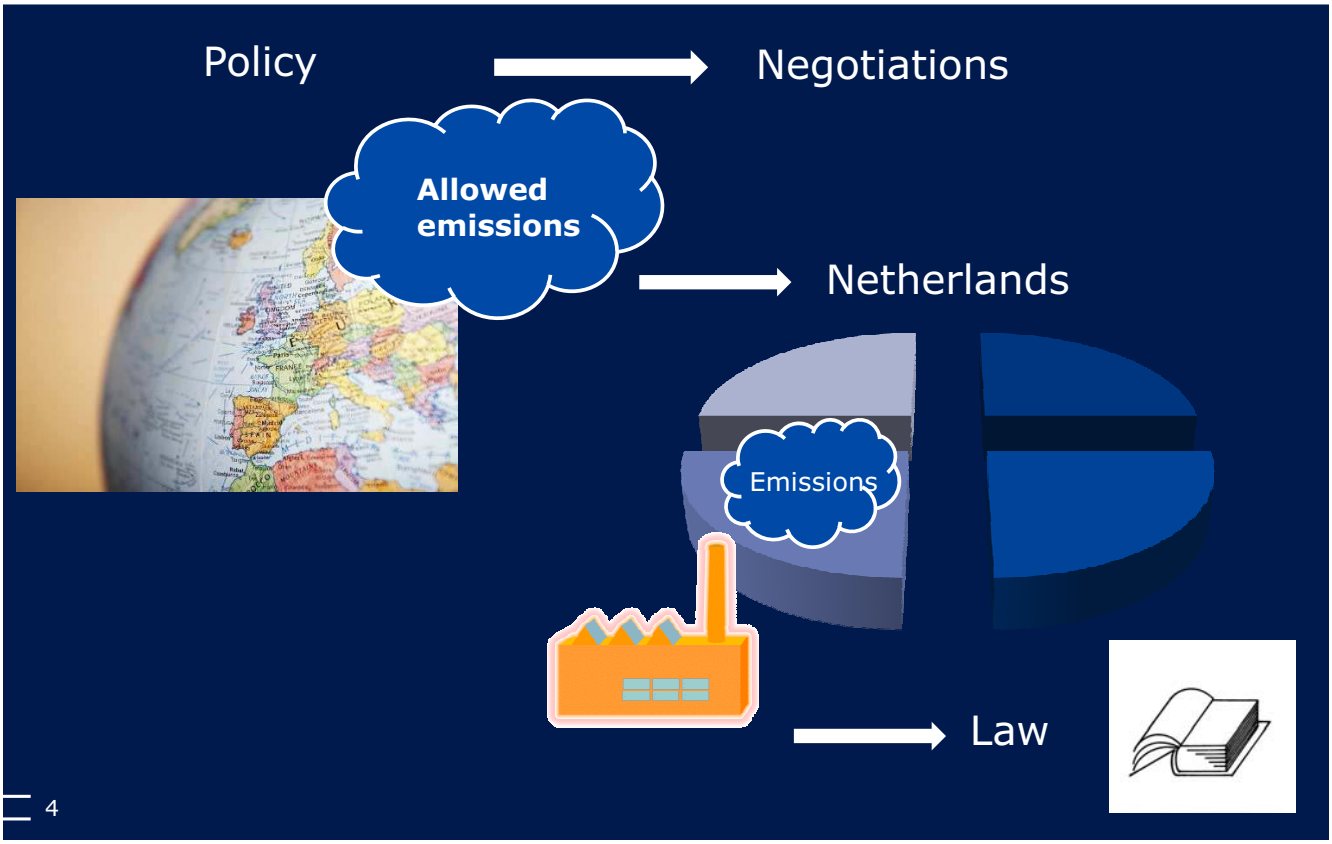
10.30 Registration Emission trading – Bas Kroon

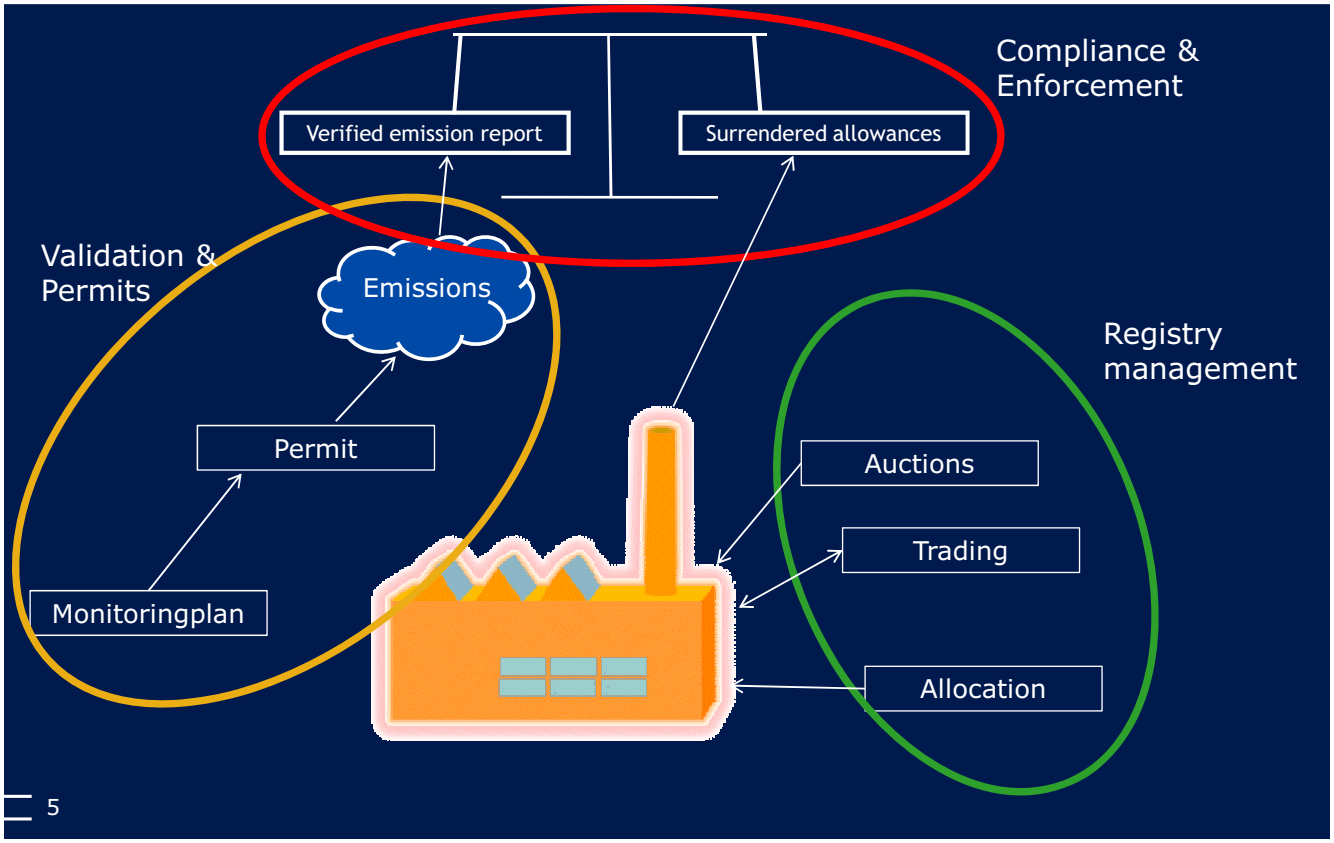
11.00 Registry training – Erik van Huis/ Helene Kossen

12.30 Lunch

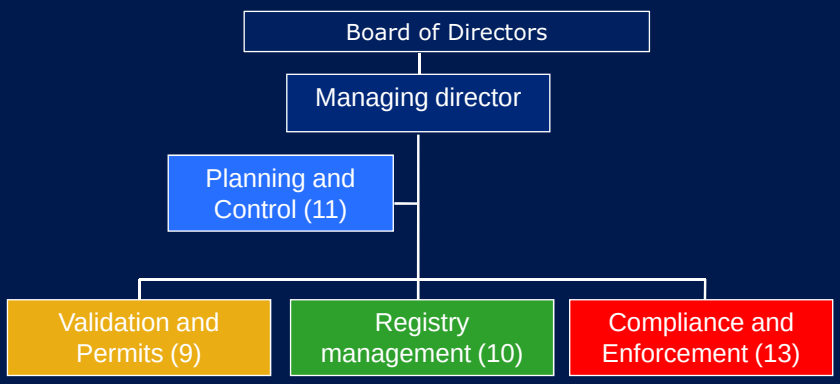
Content

- Emission trading
  - Basics
  - Role of NEa
  - Characteristics of NEa
- Approach of NEa
- Experiences
- Looking forward





Characteristics of the NEa



- 143 CO_2 emission permits
- 90 NO_x emission permits
- 240 combined CO_2/NO_x emission permits

- CO_2 Emissions: 81.1 Mton
- NO_x Emissions: 59.2 kton

Dutch approach

- Compliance assistence
- Three different expertises combined together
- Communication
- Training
- Seperate from policy

Experiences

- Implementation succesful
- Incorporated in daily business

- Complex regulations
- Only small offences
- Changing policy

Looking forward

- Further automation of workflows
- Risk based investigations
- Fraude in trading
- Biofuels

Nederlandse Emissieautoriteit
Dutch Emissions Authority

Validation & Permits
Gateway to the emission trading system (ETS)

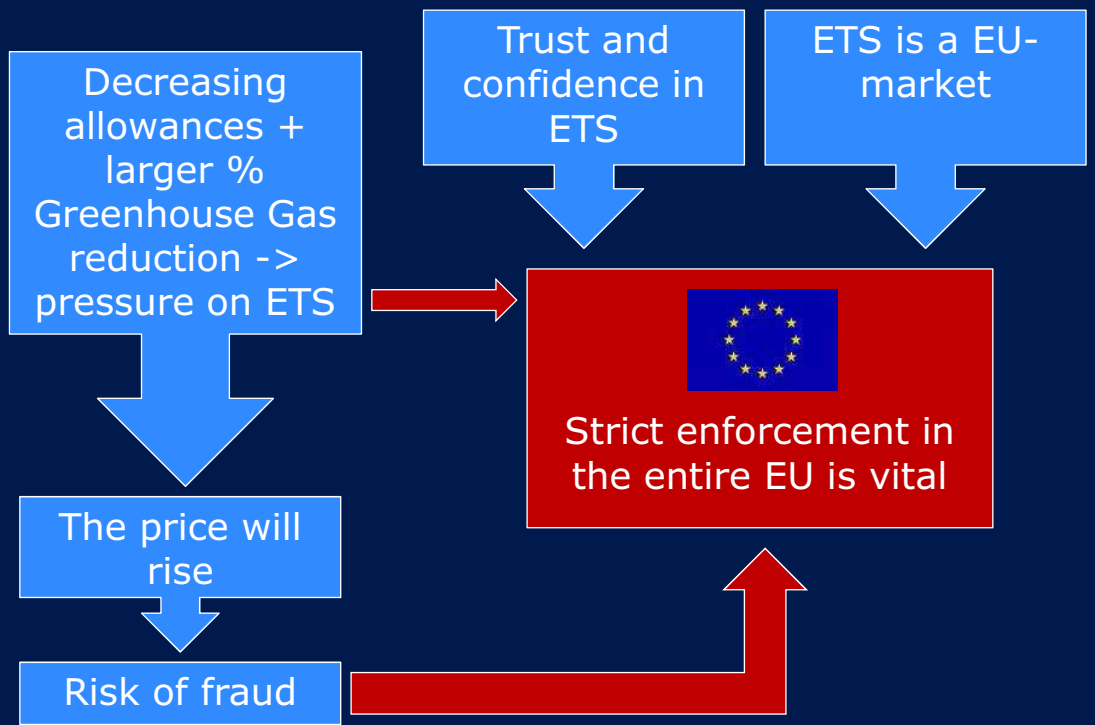
Ronald Hof

2 August 2010

Contents

- Background ETS EU level
- Monitoring CO_2 and NO_x
- Role Validation & Permits
- Validation projects
- Developments
- Questions

Background ETS EU level



Role Validation & Permits

Primary:

- Checking MPs
- Granting emission permits (20-30 p/y): 465 licensees in 2010
- Assessing notifications (180 p/y)
- Granting opt-out for NO_x

➔ approach: division between going concern and validation projects

Secondary:

- Information service for installations
- Policy advice

Monitoring CO_2 and NO_x

- ✓ Legal Guideline Monitoring (national translation from EU Monitoring and Reporting Guidelines)
- ✓ Emission permit with monitoring plan (MP)
- ✓ Monitoring with current MP by installations

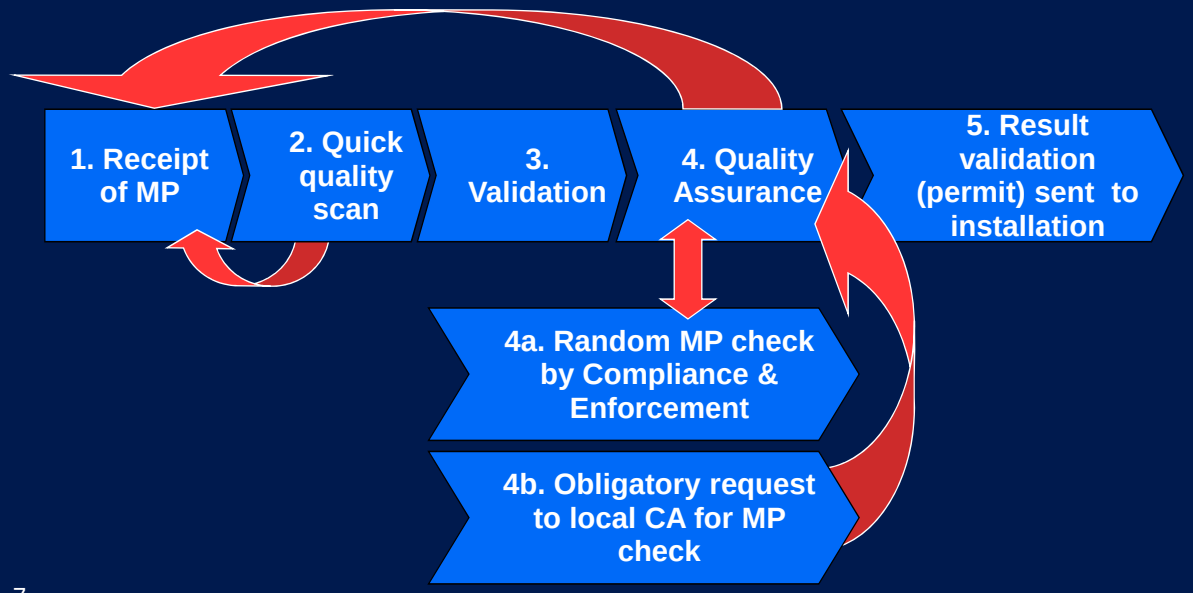
V&P

- ✓ Annual Emissions Report
- ✓ Verification by independent verifier
- ✓ Surrender allowances
- ✓ Compliance & Enforcement

Validation projects: why & how

- Obsolete MPs: 1st generation MPs assessed without experience
- new legal requirements
- Quality improvement necessary (compliance, verification)
- Approach: specific target group of licensees, sector-wise assessment, subcontracting bulk of validation work

Validation projects: workflow



Validation projects: quantity vs quality

Quantity:

- Training "How to validate a MP efficiently?"
- Separation process and content roles

Quality:

- Sector-wise assessment
- Decide basis for starting point: legislation or legislation + Guidance
- Working together, sharing insights and giving each other feedback
- Sharing thoughts with installations

Developments

- 2011: Execution allocation 3rd trading period
- 2011 : Allowances request aviation
- 2012 : Review CO_2 MPs (485 licensees)
- 2012 : Digital MPs (and later also AERs)
- 2012 : Re-validation MPs aviation
- 2013 : Implementation review

Questions

?

Contact information

- Ronald Hof
- ronald.hof@minvrom.nl

Nederlandse Emissieautoriteit
Dutch Emissions Authority

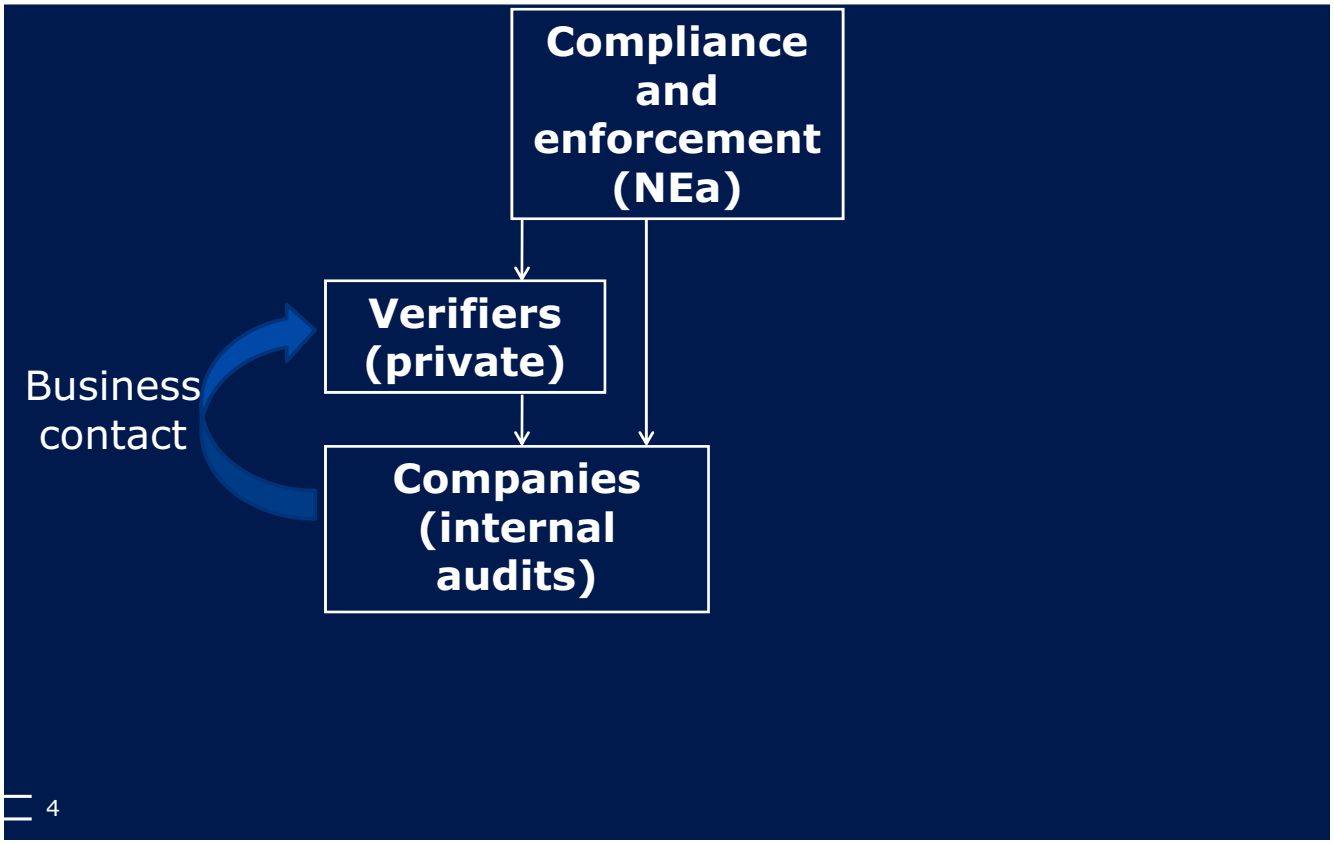
Compliance and enforcement

Bas Bougie and Rudolf van Nuissenburg

Validation and permitting	⟷	Compliance and enforcement
•Monitoring plan •Emission permit		•Practical situation •Emission monitoring
Theory	**? =**	**Reality**

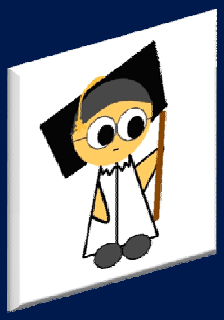
Three levels of auditing

1. Internal audits by the company
2. Audits by accreditated verifier (private, contracted by the company)
3. Department of compliance and enforcement of the NEa (public, judicial basis)



Characteristics

- Compliance and enforcement

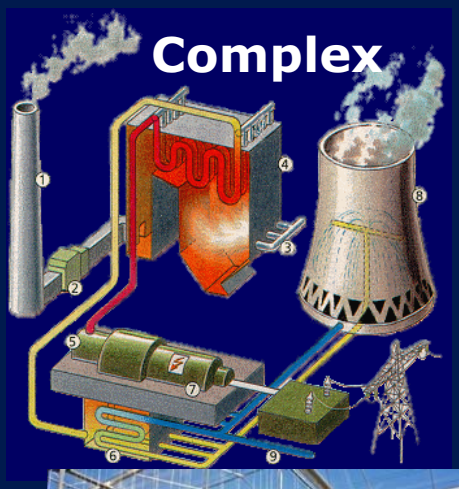


- Two roles: supervisor and enforcer

Types of investigations

- Audits
- Ex-officio determination
- Signal investigations
- Enforcement investigations
- Theme investigations
- Measurements

Diversity and complexity of companies



Preparation

- Which persons c.q. sources to be consulted
- Internal available information:

  Correspondence, emission reports, monitoring plan
- Composing audit plan
- Contact the company

The Audit

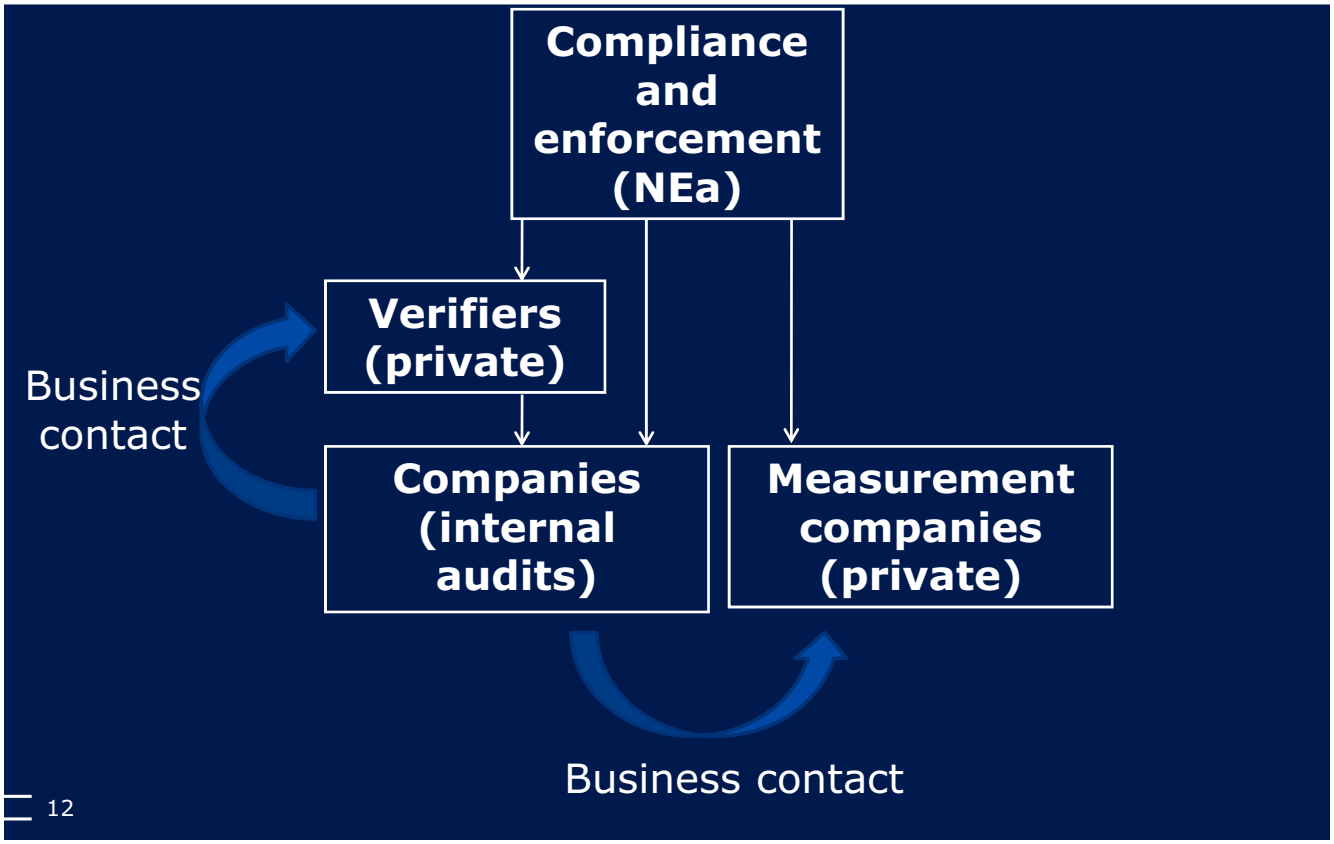
- Aim of visit
- Subjects of discussion
- Investigation and evaluation of internal systems
- Documents, tour of the company
- Concluding remarks and summary of the findings.

Most occurring shortcomings

- Disagreement between monitoring plan and reality
  - Extra source stream
  - Extra installation
- Validity of calibrations of metering equipment
- Lack in quality assurance implementation emissions trading

The day after

- Letter with findings:
  - Results
  - Official warning
  - In case of offense:
    Assessment => administrative fine / penalty imposed on a time basis in case of a non compliance
- Administration
- Aftercare



Inspection of measurement companies

- Determination of physical/chemical properties of source streams
- Check on needed instruments
- Carrying out of the measurements

Risk based investigations

- Data collected
- Experience with companies
- Too many companies to investigate each year
- Selection of companies based on indicators
- Besides that: random sample check

"Take home message"

The Dutch implementation of the emissions trading system is unique in Europe:

- Three levels of supervision
- Public level of auditing is centrally organised

Nederlandse Emissieautoriteit
Dutch Emissions Authority

Registration Emission Trading

Bas Kroon

Content

- Main characteristics of the Dutch Registry
- Main tasks of the Department Registration Emission Trading
- The Compliance Cycle
- Registry Training

Main characteristics of Dutch Registry

- Web application
- Comparable to online banking,
  - transfer of emission allowances, not money
- A secure website
  - Username and password are required

2 August 2010

Main characteristics of Dutch Registry

- Total of: +/- 650 accounts
- Almost 400 operator holding accounts
- Over 250 person holding accounts (most outside NL)
- 1300 account representatives, 2 per account

Main tasks of the Department Registration Emission Trading

- Registry administration
  - Management/maintenance
  - Transactions (10.000 each year)
- Management of Dutch government accounts
  - Allocation of emission allowances

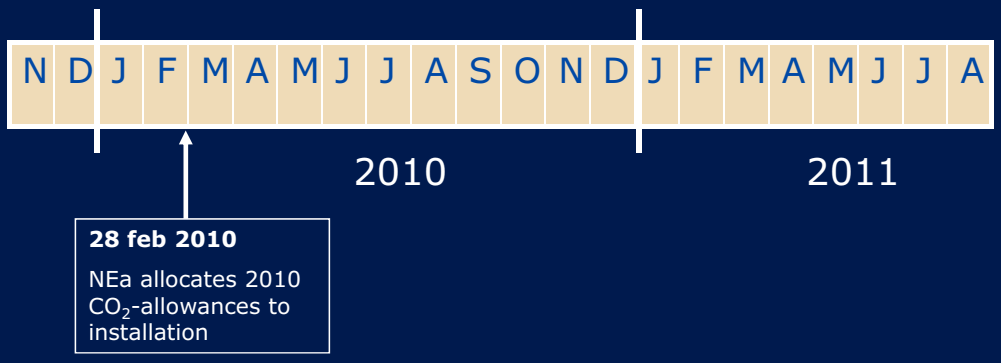
Main tasks of the Department Registration Emission Trading

- Helpdesk
  - Answering questions (2500 each year)
  - Training sessions
  - Account management
    - Opening/closing accounts
    - Carry out account changes (250 each year)

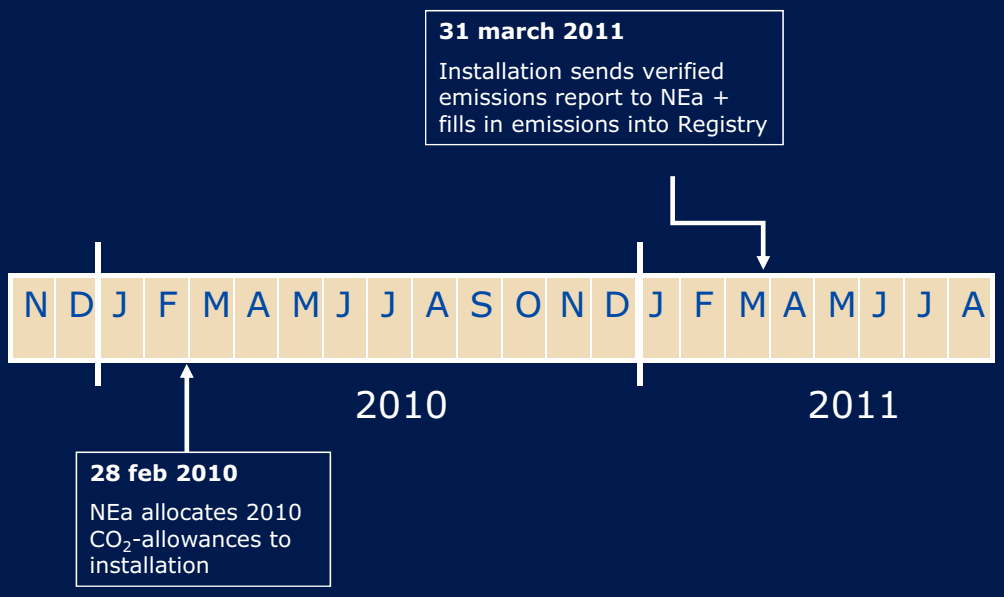
Account management: security

- In 2009 several cases of fraud
  - VAT (tax) fraud, identity fraud, phishing attacks
- NEa raised requirements for opening PHA
- At first only for new accounts
- After summer 2010 new European Registry regulations: also for existing accounts.

The Compliance Cycle

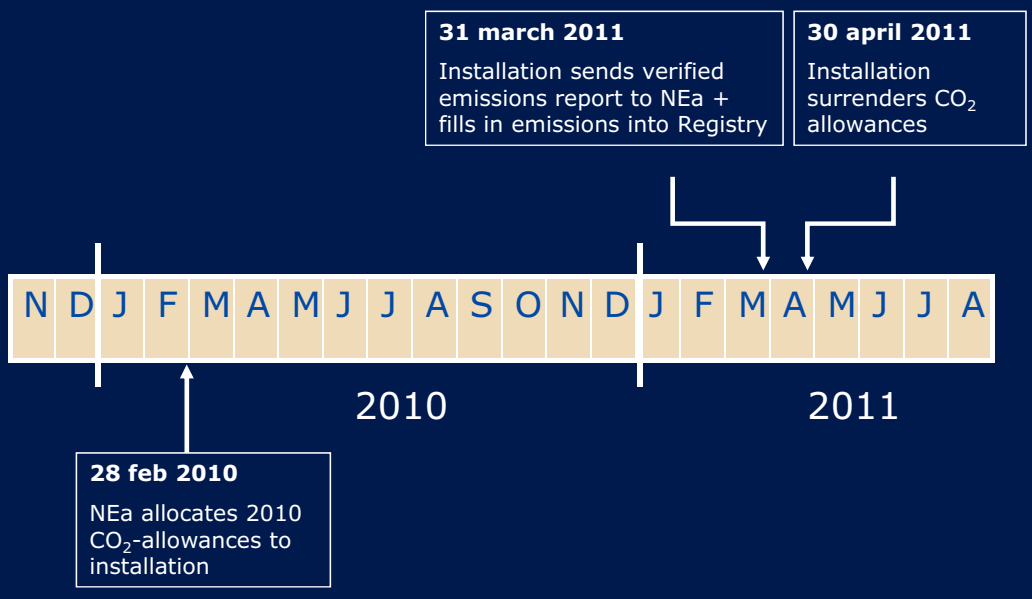


The Compliance Cycle



2 August 2010

The Compliance Cycle



The Compliance Cycle

31 march 2011
Installation sends verified emissions report to NEa + fills in emissions into Registry

30 april 2011
Installation surrenders CO_2 allowances

28 feb 2010
NEa allocates 2010 CO_2-allowances to installation

28 feb 2011
NEa allocates 2011 CO_2-allowances to installation

Surrender

deadline: 30 april

- Surrender of allowances is an active and mandatory action: surrender transaction
- NEa checks on 1 May surrender statuses of all installations
- If an installation doesn't surrender enough allowances: penalty of 100 Euros per tonne CO_2 + obligation to surrender allowances next year

Emission trading: an example

1000 allowances are allocated
Installation A has emission of 1200: HAS to buy 200 allowances
Installation B has emission of 800: CAN sell 200 allowances

Financial trading allowances

NEa
- only transactions of allowances
- no contracts/finances

Financial part of trading:
- bilateral
- trading platforms
- brokers

Training

- Let's do some CO_2 emissions trading

Nederlandse Emissieautoriteit
Dutch Emissions Authority

Training Registry

Erik van Huis and Helene Kossen

What's in front of you:

- Laptop
- Paper with login
  - Username and Password
  - Installation ID and Emissions
  - Exercises

2 Blocks

A. Presentation – by us (close laptop)

B. Show in registry – by us (close laptop)

C. Exercises – You
   - We give some help

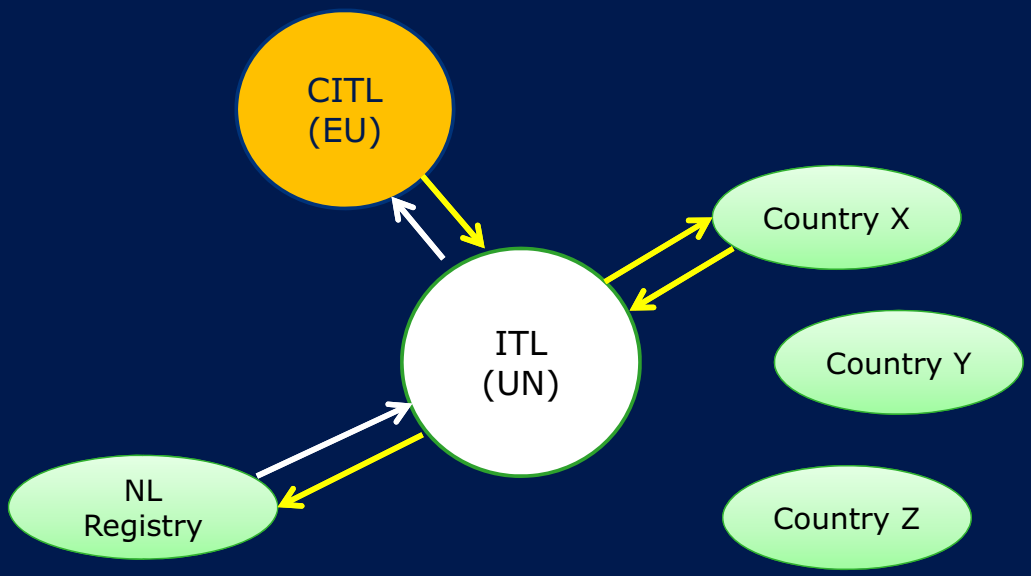
The Dutch CO_2 Registry

- Greta
- English system
- Cooperation with 13 countries

- Training environment. ITL Simulator

- Do not use the "back"button, use the menu
- Safe system

Registries and transaction message flow



Login and safety

New account

- Username (by post)
- Password (by e-mail)

- Secure connection (SSL)
- Correct domain

Step
Login
Transactions
Select Verifier
Emissions
Surrender

Transactions (1)

- Transfer: Between accounts
- Surrender: Surrender (by the end of a year)
- Cancellation: Voluntary cancellation of emissions (for compensation)

Step
Login
Transactions
Select Verifier
Emissions trading
Surrender

Transactions (2)

Important

- Kind of emissions (EUA_AAU)
- Check the receiving account nr
- Internal – Within Registry
- External – Outside Registry (no check!)
- Check
  - Status: Complete, Proposed, Rejected

Exercise 1

Step
Login
Transactions
Select Verifier
Emissions
Surrender

Enter verified emissions and verification

31 march 2011
Installation reports verified emissions 2010

30 april 2011
Installation surrenders CO_2 allowances

28 feb 2010
NEa allocates 2011 CO_2-allowances to installation

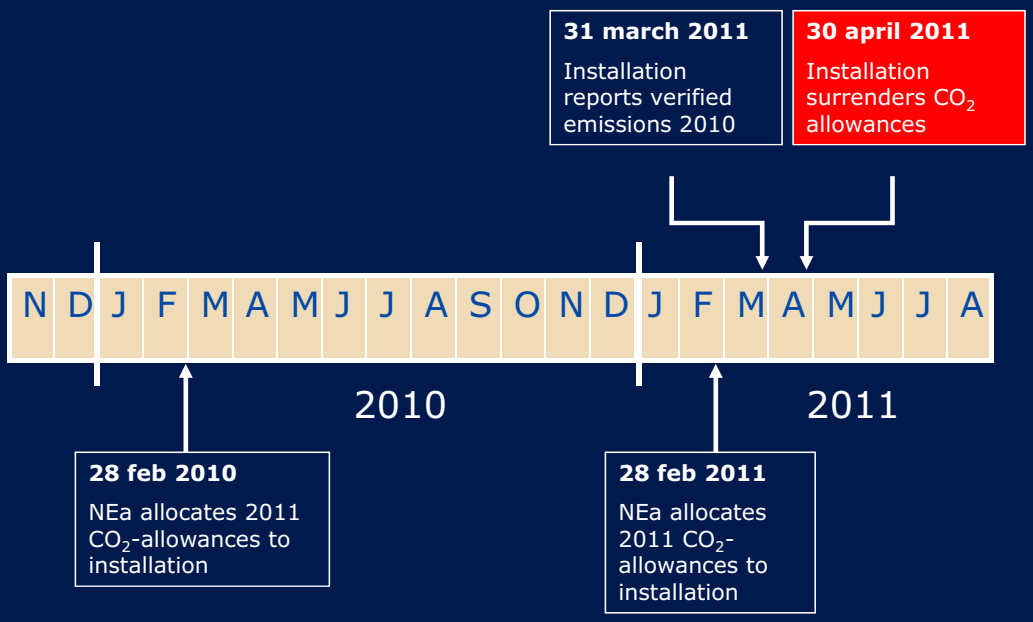
28 feb 2011
NEa allocates 2011 CO_2-allowances to installation

Emissions

- Installation ID
- Fill in Emissions
- Wait for verification
- Check verified emissions

Step
Login
Transactions
Select Verifier
Emissions
Surrender

Surrender



Enough allowances?

- Be sure of enough allowances
  - Allowances >= Emissions
  - Try to get enough allowances trought trading with your neighbour

Step
Login
Transactions
Select Verifier
Emissions
Surrender

Surrender

- Surrender transfer in the Registry

Allowances left on account?
- Save for the next year
- Sell
- Voluntary cancellation

- Check your year results

Exercise 2

Step
Login
Transactions
Select Verifier
Emissions
Surrender

More info?

Internet: www.emissieautoriteit.nl

Ministry of Housing, Spatial Planning and the Environment

European Emission Trading system for Aviation

ICAP, August 3th

August 3, 2010

Content

1. ETS for aviation
2. Cap
3. Scope
4. Who is the competent authority?
5. Monitoring emissions
6. Monitoring TKM
7. Impact on sector/market
8. Sanctions
9. Challenge

Emissions trading for aviation

- Entered into force on 2 February 2009
- Had to be implemented by 2 February 2010
- 2 periods:

-2012
-2013-2020

- 2010 en 2011 are pre trading years, no surrendering of allowances just monitoring
- Task force aviation: task force compliance forum/ harmonise implementation

CAP

Historical emissions (cap setting)

- average 2004-2006
- basis for allocation process:
  - 97 % of average 2004-06 emission levels in 2012
  - 95 % of average 2004-06 emission levels from 2013

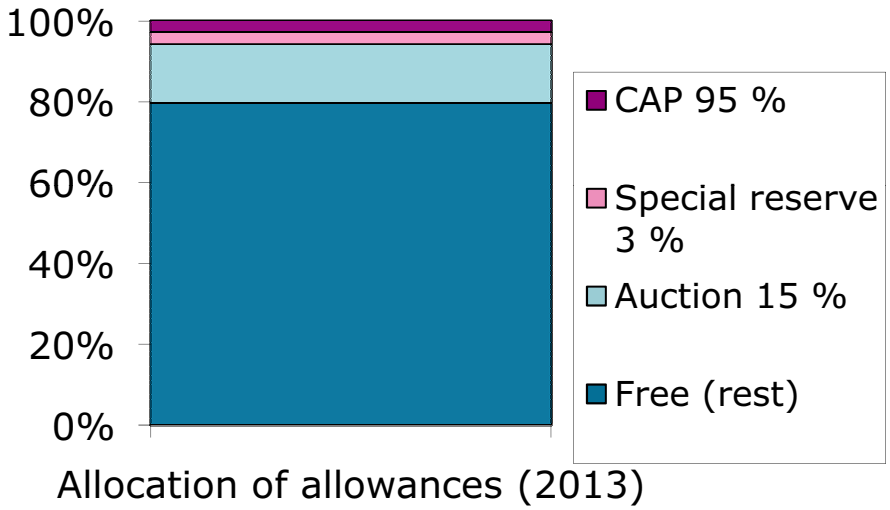
CAP/Allocation

Allocation

- 15 % allowances via auction
- 3 % special reserve (new entrants and fast growers)
- remaining are free allowances

CAP

100 % = Historical emissions 2004-06



Scope

All flights to and from EU Member States

Exemptions

- Military,police, customs
- Flights with a maximum take of mass of less than 5700 kg
- VFR
- Circular flights, training flights, government flights (3rd countries), medical, rescue, research etc.

Threshold for commercial operators

- < 243 flights per 3 periods of 4 months OR
- < 10 000 tonnes CO_2 emissions

Administering member state

Every operator is linked to an administering member state

Indication of administering Member State:

- operating licence
- the member state that the operator performed the most flights on in a certain year

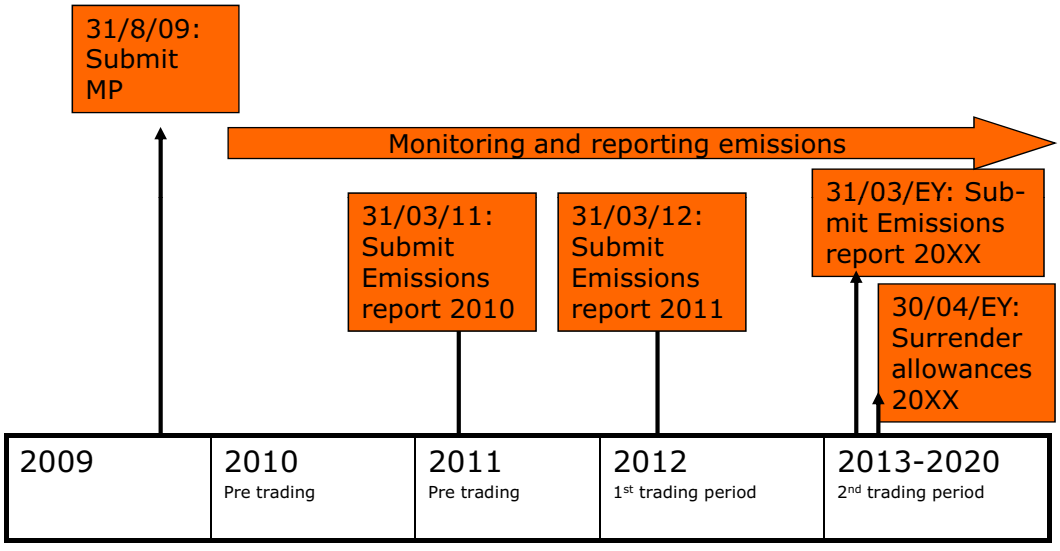
The Commission has published a list of aircraft operators specifying the administering member state for each aircraft operator

Administering member state

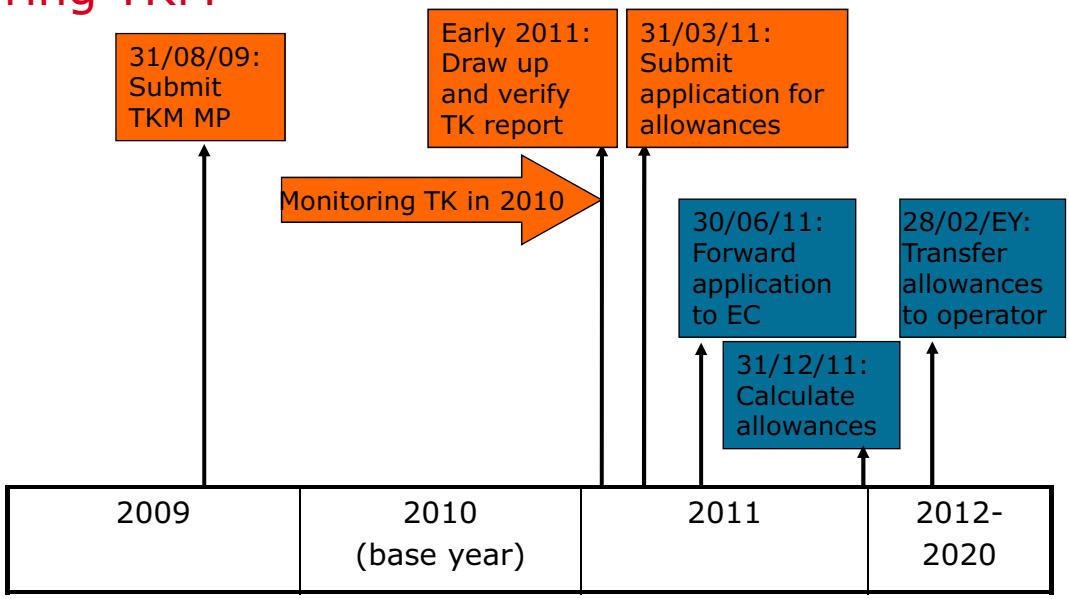
Netherlands:

- Nea = competent authority
- 76 aircraft operators, 17.5 Mton
- Commercial and non-commercial
- KLM, Martinair, Northwest Airlines

Monitoring emissions



Monitoring TKM



Impact on sector

Carbon leakage:

- Most costs can be passed on to consumers
- All costs for intra-EU flights can be passed on
- 50-100% for intercontinental flights. Small risk on carbon leakage

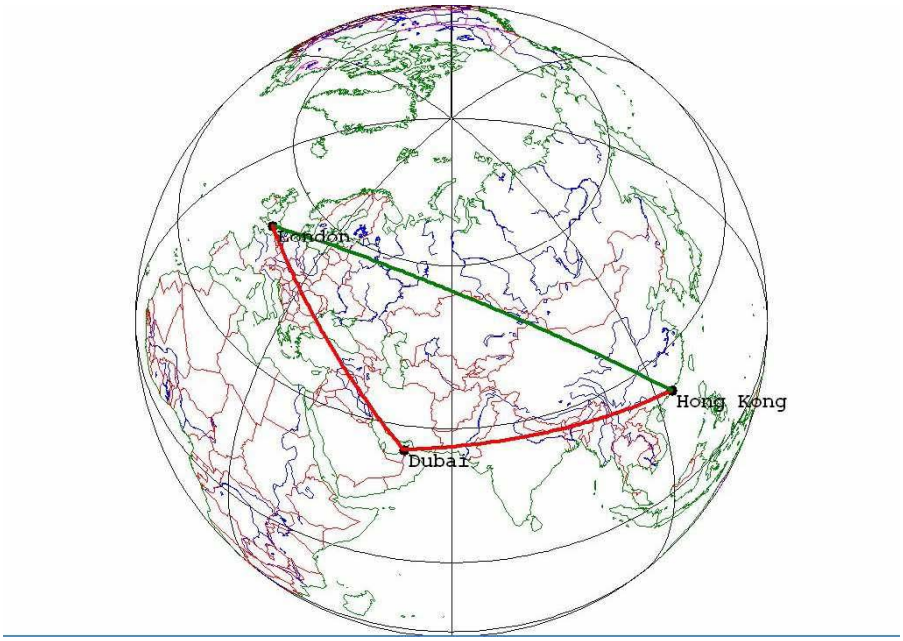
Effect on ticket prices:

- Ticket price may rise with 5-20 euro

Effect on demand:

- Demand may fall with 1-2%

Potential carbon leakage



Impact on market

- Half-open system
- Impact is estimated to be small
- Aviation sector will be a net buyer. This can lead to less available rights and higher prices.

Sanctions

If not enough allowances are surrendered:

- fine of 100 euro per ton CO2 AND
- Compensation (allowances have to be surrendered next year) AND
- Publication of operators (naming and shaming)

When all enforcement measures have failed to ensure compliance, the administering member state can request the Commission to decide on an operating ban

Challenge

Opposition airlines:

- Legal debate started by U.S. Airlines for violation of Chicago convention (Continental Airlines, United Airlines)
- British court referred to the European court of Justice
- European court will rule on the validity of the European directive

Thanks for your attention! Questions?

Developing countries in the Global Carbon Market

Overview and Development

Presentation to ICAP Summer School

4 August, the Hague

Session Outline

1	Developing countries in climate regime
2	Project based approaches to mitigation
3	Sectoral Approaches
4	Why MRVCE is important
5	Outlook for the market in 2010
6	REDD and the carbon market

1	**Developing countries in climate regime**
2	Project based approaches to mitigation
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Developing countries in climate regime

UNFCCC "Common But Differentiated Responsibilities" splits developed and developing countries

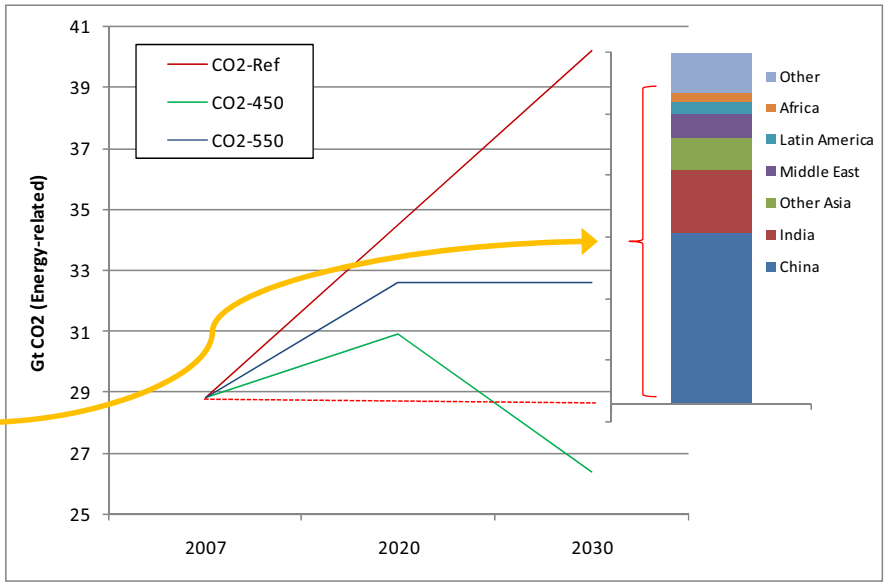
- Under the Kyoto Protocol, A1 parties signed up are required to reduce emissions from 1990.
- Developing countries have no mandatory obligations:
  - avoids restrictions on their development and poverty alleviation
  - can sell emissions credits to developed countries
  - Can get money and technologies for low-carbon investments.
- Developing country emissions will continue to grow for some time yet, however its not always a constraint to reduce emissions and its possible to pursue economic growth whilst reducing emissions.
- Developed countries will provide financial support to developing countries to move towards a low carbon economy.

Addressing Climate Change will be challenging and requires global action

Minimising risks of temperature increases <2ºC means global emissions probably need to peak before 2020, and reduce by 50% below current levels by 2050 (IPCC 2007 4th AR)

Developing countries are most vulnerable to risks associated with climate change

Their role in addressing the problem is also critical, accounting for 90% of near term growth in energy related emissions

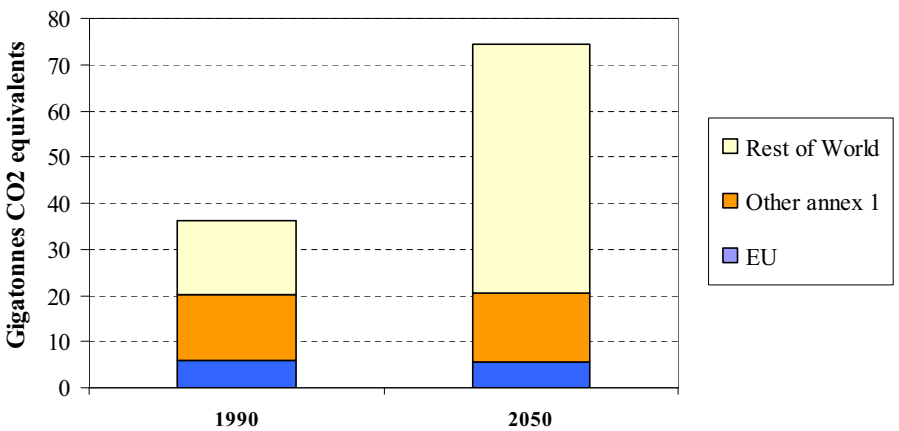


Source: IEA WEO 2009

2℃ impossible without significant developing country action by 2020

Even if developed countries peak in 2012, reduce by 25% below 1990 in 2020 and 80% in 2050, 2°C is impossible unless developing countries can peak around 2020

Figure 1: Projected development of greenhouse gas emissions in different regions of the world



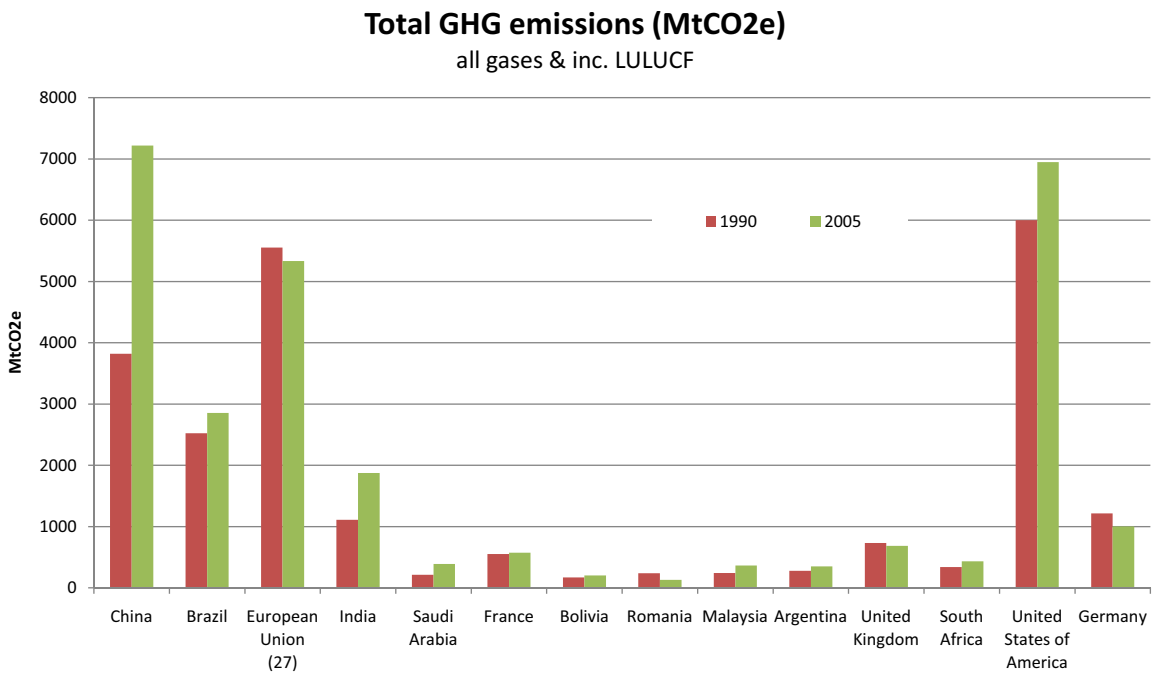
Source: Greenhouse gas reduction pathways in the UNFCCC process up to 2025, CNRS/LEPII-EPE, RIVM/MNP, ICCS-NTUA, CES-KUL (2003).

China is around 30% of developing country emissions

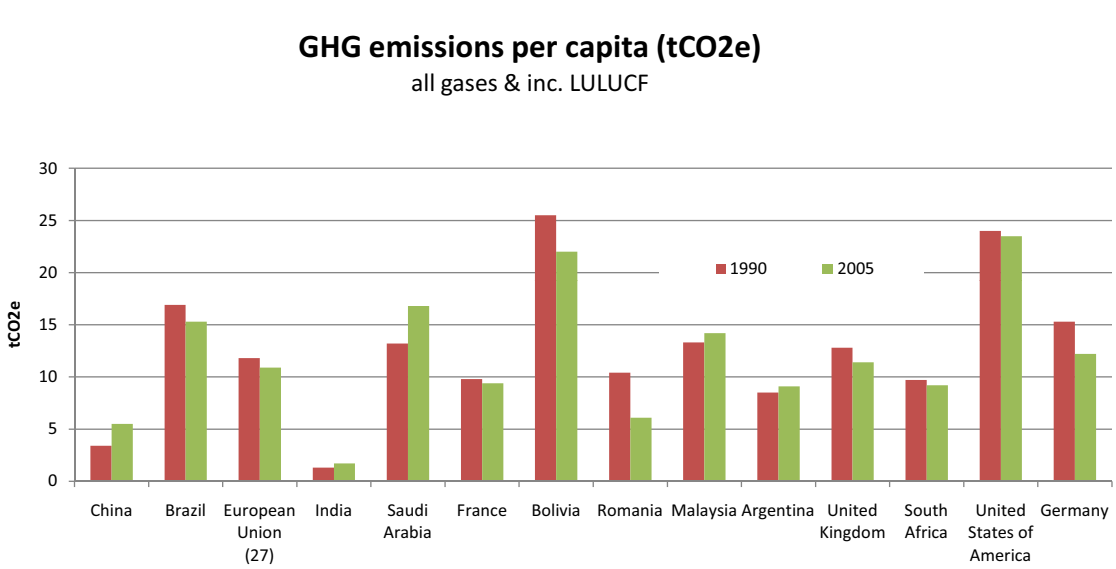
Later global peaking (2020) is possible but much more expensive

IEA says $500bn extra cost (over period 2010-2030) for every year of delay

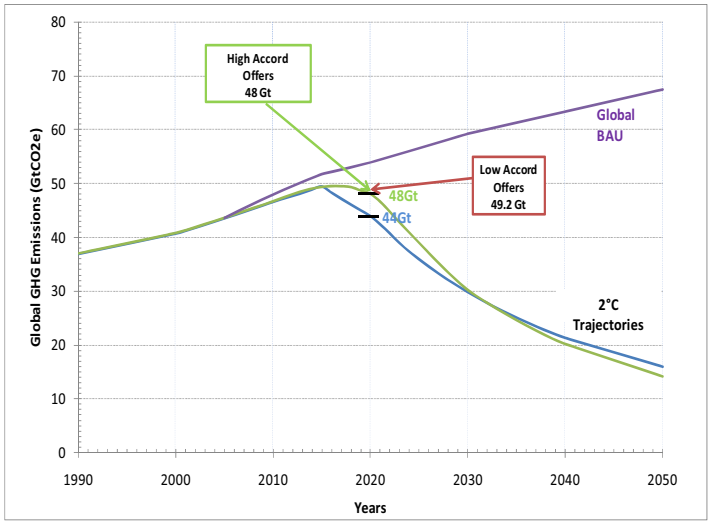
The global outlook has changed since 1990



Emissions per capita has changed since 1990



COP 15 in Copenhagen led to a softening of the distinction between developed and developing countries



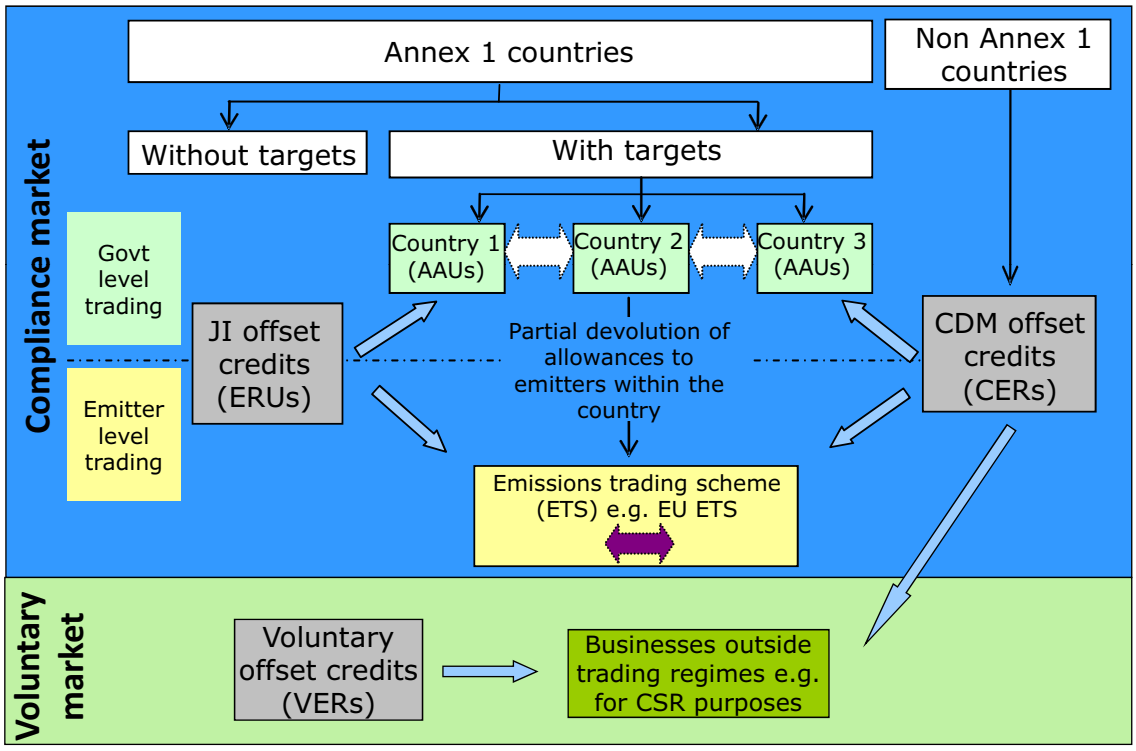
Copenhagen Accord

For the first time all major emitters (and over 100 countries in total) have committed to action reducing the trajectory of their emissions. The Accord enshrines:

- 2 degrees goal
- required developing as well as developed countries to set out their emissions reduction commitments
- $30bn fast start finance
- long-term $100bn goal

If delivered in full, the offers which countries have put forward under the Copenhagen Accord would be consistent with global emissions peaking by 2020 although deeper, faster cuts would be required in later years to achieve a 2 degrees trajectory.

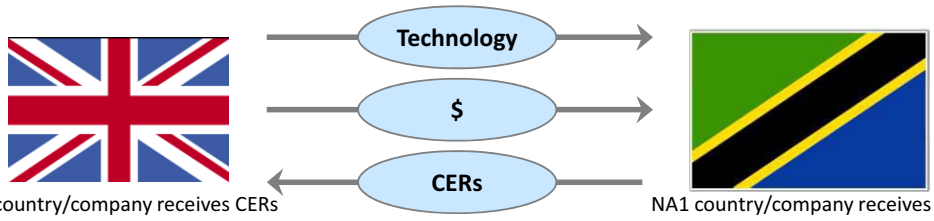
How the carbon market works in practice



1	Developing countries in climate regime
2	**Project based approaches to mitigation**
3	Sectoral Approaches
4	Why MRVCE is important
5	Outlook for the market in 2010
6	REDD and the carbon market

The CDM has helped engage developing countries in climate change mitigation

Description



A1 country/company receives CERs they can use as a cost-effective way of meeting their GHG target

NA1 country/company receives tech transfer, investment to help contribute to sustainable development goals

Achievements

So far helped to fund over **2,000 low carbon projects** in developing countries, reducing GHG emissions by **~350MtCO$_2$e/year.**

But also criticised for:

- No net global emissions reductions
- Inefficiency – high transaction costs
- Environmental integrity – risk that of non-additionality
- Unequal geographical distribution

Current approach to CDM project approval

Two fundamental requirements of project developers:

1. to establish a baseline or business as usual scenario against which a project can be credited

2. to demonstrate additionality of the project

For most CDM projects, the baseline and additionality are determined on a case-by-case basis which can be costly to determine

What are standardised approaches?

- CDM methodologies based on uniform methods and procedures applicable to multiple projects
- Already possible under the CDM but not widely used
- For example, this could involve setting a performance standard for a particular project type in a particular country
- An individual project would be compared against the performance standard in order to assess whether it is additional and, if so, the quantity of credits it can earn

➢ **No need for a project-specific baseline**

➢ **Provides a more objective additionality test**

Standardised approaches offer benefits over the current CDM

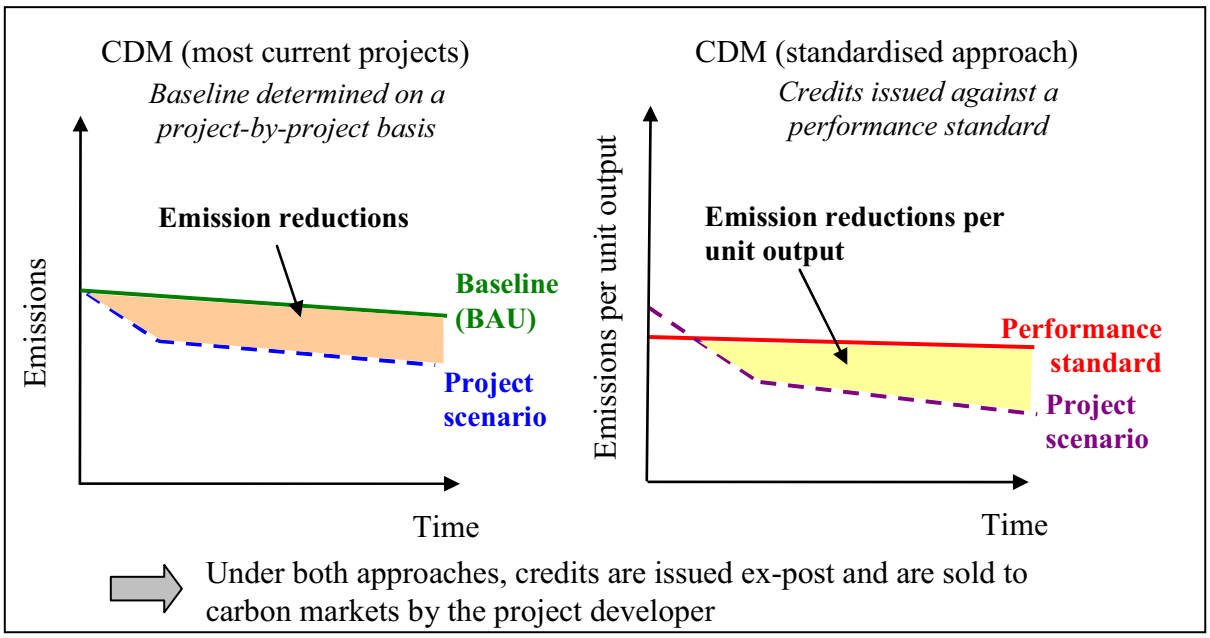
1. **Efficiency:** Lower costs, complexity and uncertainty
2. **Environmental effectiveness:** consistent additionality test
3. **Equity**: Improve access to CDM by reducing costs and complexity

There are challenges also

- Upfront data requirements
- Ensuring currently under-represented countries have sufficient access
- Need to ensure the performance standard is set at the right level to balance under-crediting and over-crediting
  -important for ensuring environmental integrity

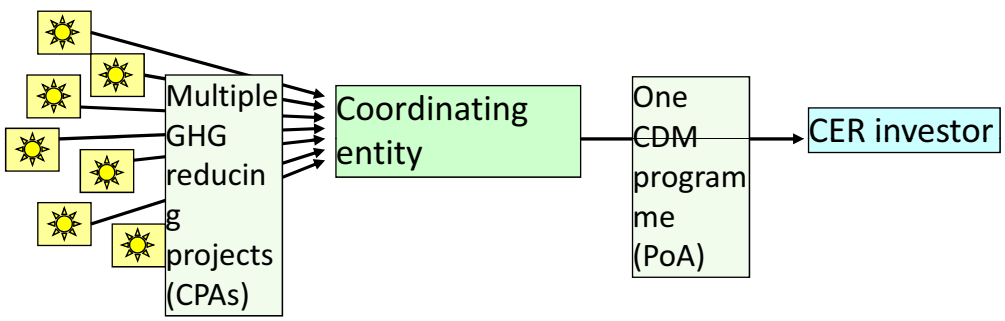
Opportunity for your governments to consider how to overcome these challenges in order to achieve the benefits.

An illustration



Programmatic CDM ('PoAs')

- **PoA**: Programme of Activities
- Able to cover multiple activities ('CPAs') under one programme:



- Different locations and/or timing possible
- Ideal for small projects that wouldn't be cost-effective on their own
- Examples: – Solar heating systems in Bangladesh
  - Energy efficient lighting in rural Senegal
  - Uganda Municipal Waste Compost

There is also a volunatry carbon market but there are key differences between it and the regulated market

Regulated Market (JI, CDM credits)

- Is internationally supervised and regulated (CDM Exec Board)
- Its mainly used in compliance markets to help companies meet their targets in emission trading systems or for governments to meet obligations under the Kyoto Protocol.
- Registries track and monitor trades
- Strict additionality criteria enforced
- Third party verification

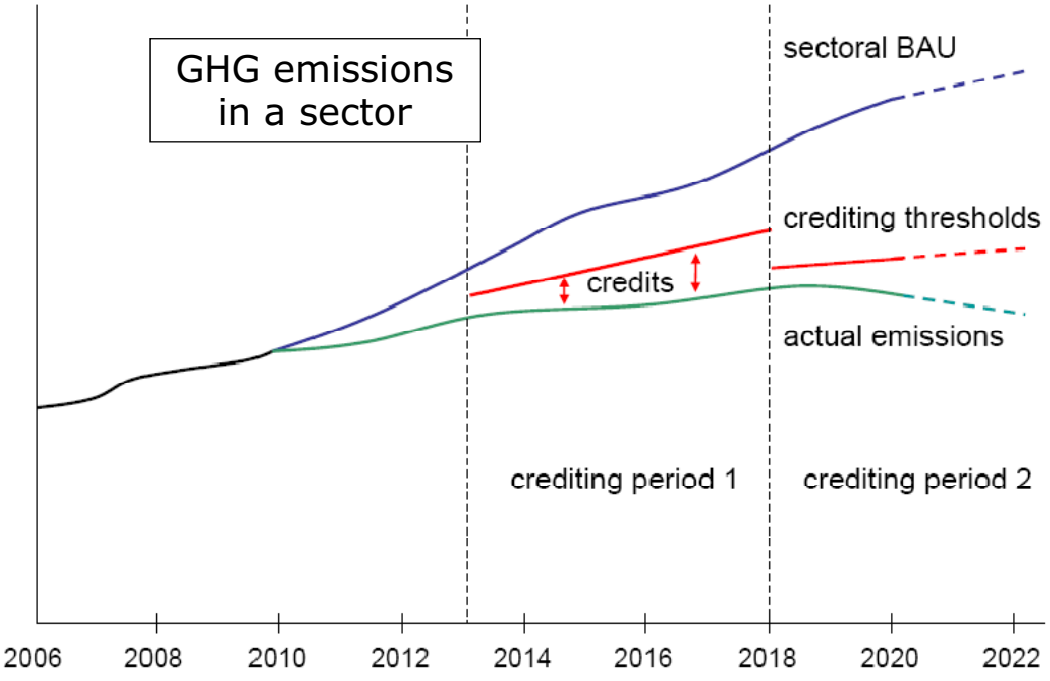
Voluntary Market

- No international supervision – self regulated.
- Cannot be used for compliance purposes
- Often used by individuals and companies who wish to secure cheaper offsets
- Sometimes lack of transparency in the provision, verification and provenance of the offset – led to criticisms of the market
- They do not consistently provide for emissions reductions that are additional to what would have happened without the project

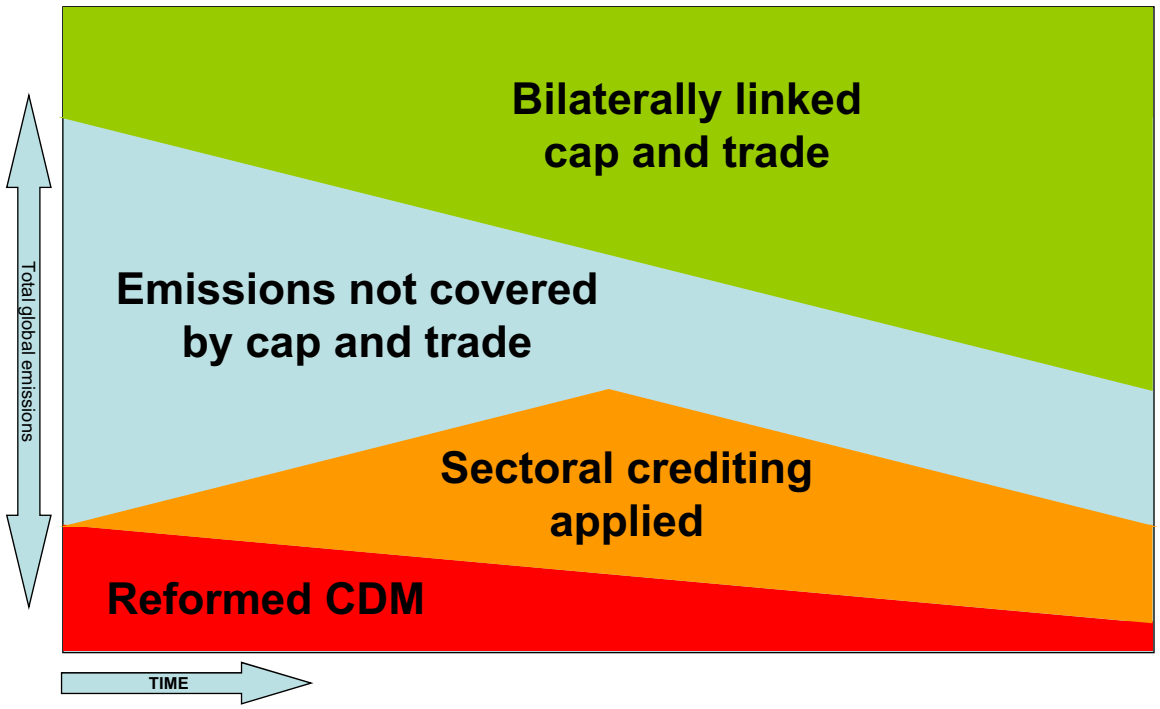
In the negotiations, countries are supporting offset reform and a transition to new sectoral mechanisms

- Through negotiations
  - Reform of the CDM to improve environmental integrity and process; focus on LDCs
  - Gradual replacement of CDM by sectoral crediting mechanism for emerging economies and competitive sectors
  - Sectoral crediting as a stepping stone to multi-sectoral cap and trade

The transition: How would sectoral crediting work?



The EU roadmap to an international carbon market: a three-step approach

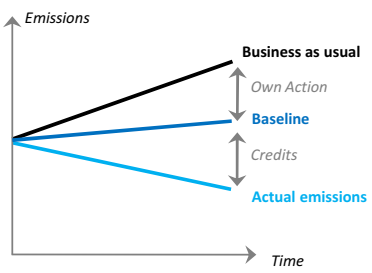


New large scale market mechanisms will help transition away from the CDM and scale up carbon markets

Sectoral Crediting
Also referred to as 'sector no lose target'

- Includes **own contribution**
- **Ex post** issuance of credits to Government, i.e. once emissions are verified
- **No obligation** for Governments to purchase extra credits if baseline not achieved

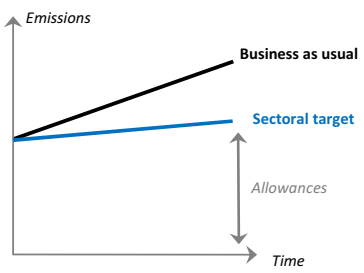
Illustration of sectoral crediting



Sectoral Trading

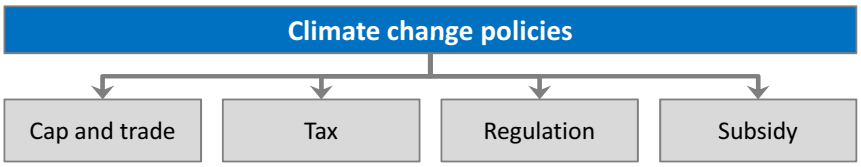
- Includes **own contribution**
- **Ex ante** allocation of allowances to Governments, i.e. before emissions have actually occurred
- **Obligation** to buy extra allowances and/or credits if sectoral target is not met

Illustration of sectoral trading



Sectoral mechanims can be designed to deliver national climate change policies

- A number of developing countries have already proposed/implemented climate change policies that are appropriate for their national circumstances.
- The carbon market is a low cost policy tool to reduce emissions – even in the absence of international demand for offsets, the carbon market drives technological innovation, creates jobs, and reduces emissions cost effectively at a domestic level.



- Large scale 'sectoral crediting' mechanisms can help provide carbon market finance to undertake additional action.
- Carbon market finance is generated by the sale of 'sectoral' offset credits.
- International verification of emission reductions is essential before these credits can access the international carbon market.

Countries will want to consider the different policies to mitigate climate change

	Regulation	Emissions Trading	Carbon Tax	Subsidies (tech)
Certainty over?	**Emissions**	**Emissions**	**Price**	**Price**
Least cost emissions reductions	**No** (depends how targeted)	**Yes**	**Yes**	**No** (depends how targeted)
Incentives for innovation	**No**	**Yes**	**Yes**	**No** (depends how targeted)
Admin costs	**High**	**High**	**Low**	**High**
Harmonising across countries	**Difficult**	**Relatively easy**	**Difficult**	**Difficult**

However, the carbon market is not a silver bullet

Governments will need the full range of policy tools to reduce emissions effectively

- **Subsidies**
- **Regulation**
- **Taxation**
- **Cap and trade**

Other policy tools will be needed to:

- Guarantee long-term low carbon investments.
- Drive technological innovation and finance R&D - carbon markets are best suited to promote existing and proven technologies.
- Trigger behavioural change and promote energy efficiency of end users.

Significant opportunities exist for affordable emission reductions in many countries. However, the overall costs will depend on the level of reductions undertaken

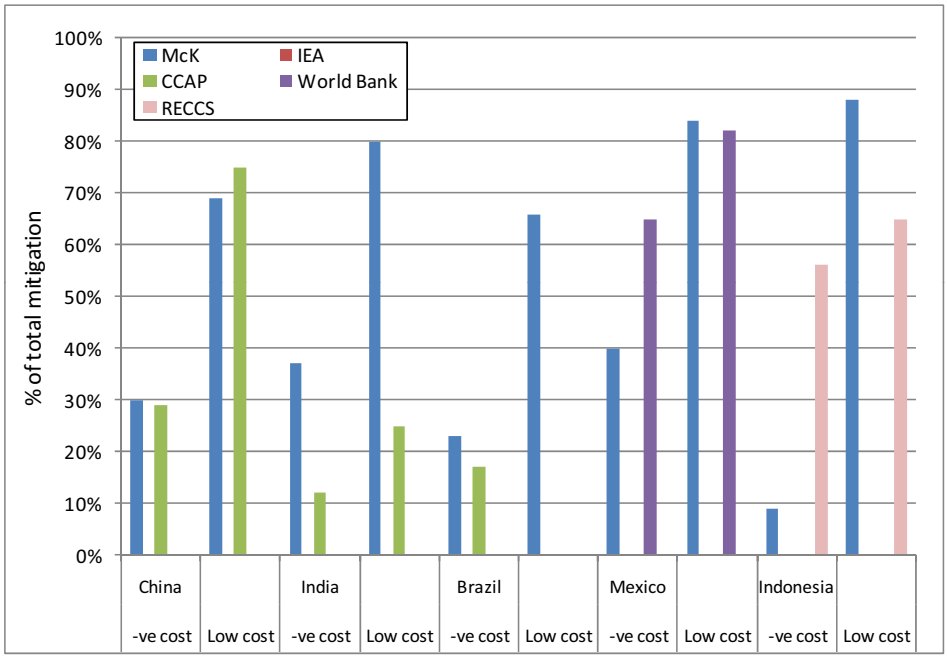
Many countries have high levels of low cost potential

Energy Efficiency Measures (All countries)

Forestry / Agriculture (Brazil, Indonesia, East / Central Africa)

Power generation (China, India, Mexico)

Reductions can move countries a significant way towards low carbon growth



Estimates of low cost potential
[Negative (-ve) cost - <$0 tCO2, Low cost - <$25 /tCO2]

Examples of country approaches

Country	Policy
India	Domestic Energy Efficiency trading scheme
China	Pilot domestic ETS as part of next 5 year plan
South Korea	Domestic ETS by 2012
Mexico	President committed to ETS
Brazil	Treasury exploring ETS
Kenya	Announced investigating regulatory framework for a domestic ETS

Our goal is to test new mechanisms on the ground and build capacity – Indian example

UK is closely collaborating with the Indian Bureau of Energy Efficiency on the design and implementation of their energy efficiency trading scheme (PAT scheme)

What is the PAT scheme?

- The PAT scheme is an energy efficiency trading scheme covering :
  - 9 large energy-intensive sectors (eg. power, iron and steel, cement)
  - Around 714 installations
  - Around 10-15% of India's total emissions
- The scheme aims at:
  - Promoting energy efficiency
  - Setting energy intensity targets for each installation
  - Crediting tradable energy saving certificates, denominated in tonnes of oil equivalent, to installations outperforming their targets

Ensuring environmental integrity of offsets - MRVCE: Definitions

The UNFCCC does not provide a clear definition of M,R and V. There is however a need for international coordination to ensure that MRV standards are comparable and enable linking between trading schemes and offsets.

Monitoring

- Determination of emission
- Quality assurance throughout the reporting period

Reporting

- Emissions during reporting period
- Additional info, e.g. quality assurance

Verification

- What is the accreditation process?
- Has emission determination been carried out correctly?
- Are reported values correct?

Compliance

- Certificates equalling reported amount are returned

Enforcement

Ensures that provisions in MRVC are implemented as foreseen

Source: Ecofys

Why MRVCE matters

Because it is the **first step** to building any type of carbon market mechanism:

➡ Necessary to have accurate measurements and reliable historic data to set targets

Because it helps **build trust** in carbon markets as they evolve, mainly in 3 ways:

1. Promoting **transparency**
2. Building **credibility**
3. Ensuring environmental **integrity**

Because when linking happens, a **ton needs to be a ton**, i.e. comparable value of certificates/allowances

The EU ETS has developed MRV Guidelines that have proven to be efficient and robust

The outlook for the Carbon Market in 2010 is tough

Based on World Bank Report

- 2009 has been the toughest year so far for the market – mixed signals of progress
- Value of the market as a whole in 2009 was $144bn – an increase of 6% from 2008 ($135bn) EU ETS is still the engine of the market and was worth $118.5 bn.
- Direct investment in CDM decreased by 59% to $2.7bn (the second year in a row investment has dropped). Why?
  - reduced compliance need for offsets in EU ETS;
  - less project origination by intermediaries;
  - competition with AAU's;
  - uncertainly of post 2012 framework.
- China was responsible for 72% of CDM projects in 2009. Africa which has traditionally been a low recipient of carbon finance increased its share to 7% (previously 3%)

Likely demand for new sectoral offsets?

- EU
  - transition from project-based offsetting under the CDM towards sector-based crediting, in particular for advanced developing countries
  - Need for Pilot initiatives as they would make it possible to move the debate forward by putting the idea into practice.
- US
  - Bills in Congress and Senate support sectoral credits from 2016 to be used in a US ETS.
- Japan
  - -25% pledged at Copenhagen. Approx 50% likely to be met through international offsets
- Australia/New Zealand
  - Likely to be a be a buyer of credits
- Volume and demand for sectoral mechanims is likely to be larger due to tougher targets from A1 and efficiency of sectoral approaches to CDM
- Likely to be increasing NA1 → NA1 carbon market flows
- Carbon market flows and financial flows to developing countries is driven by the demand and ambition of developed country targets and actions

REDD in the carbon market

Commonly raised concerns around including REDD+ in Carbon markets:

- Methodological/design issues: Lack of permanence, leakage and lack of additionality will undermine confidence in REDD credits
- Cheap forest credits could flood the market, collapsing the carbon price
- The carbon price may be much higher than the cost of producing credits resulting in large profits or 'rents' going to developing countries.
- Paris-Oslo process (March-May 2010) non-binding partnership to coordinate action on REDD+. 50 countries signed up ~$4bn available for REDD +

- REDD+ - Reduced Emissions from Deforestation plus – goes beyond REDD enhancing forest stocks, conservation and sustainable forest management

REDD+ could be financed through the carbon market as soon as REDD+ credits are market ready (~2020)

Before REDD+ credits can enter the market the following concerns needs to be addressed:

- **Leakage** (whether at national or sub-national level) – occur when mitigation activities in one place cause an increase in emission elsewhere. Could be minimised by setting national baselines and a small proportion of credits set aside as a buffer stock to guard against risk of reductions not being permanent.

- **Permanence -** forests are vulnerable to natural disturbances which release carbon back into the atmosphere thus need to take long term responsibility for carbon stocks. Could be managed through buffers at the national level (currently under VCS), central reserves of credits and insurance.

- **Additionality** is the requirement that the GHG emissions after the implementation of the reduction project are lower than those that would have occurred in the most plausible alternative scenario to the implementation of the activity – less of an issue under the national approach to REDD+ projects b/c of national reference levels – uncertainties in establishing reference levels.

- **Cheap credits flooding the market** can be overcome by ensuring targets are sufficiently ambitious & through setting a quantitative supplementarity limit on how many REDD+ credits can enter the market (EU signed up to this in principle) – the most efficient approach is to tighten A1 mitigation targets.

- **Rents** the cost of reducing a tonne of deforestation maybe less in many cases than the global carbon price leading to profits flowing to developing countries. We may have to accept some rents flowing to REDD+ nations as normal part of functioning market as when included the benefits of REDD+ far outweigh the costs.

REDD-plus

- As the negotiations on REDD-plus are quite advanced compared to many other issues,
- The EU has called for an agreement in Cancun on a 50% reduction in deforestation by 2020 and halting global forest loss by 2030.
- Major areas still to be agreed upon before COP 16 in Cancun include:
- the financing modality (market based, fund based or a mixture of the two);
- the method of deciding the reference levels for forest emissions (projections of business-as-usual trends, negotiation or historical records), and
- national versus sub-national approaches to REDD-plus (if incentives would be provided to developing countries only if mitigation benefits were achieved at national level or if sub-national mitigation actions could receive incentives).

Paris-Oslo Process (March-May 2010)

- A non-binding partnership on REDD-plus was established with the aim to help coordinate and scale up action on REDD-plus.
- 50 countries participated & signed the agreement.
- Approx. 4 billion dollars will be made available for measures to reduce GHG emissions from deforestation and forest degradation in developing countries, and partners have expressed their willingness to scale up financing substantially after 2012 provided that sufficient emission reductions are achieved.
- The Forest Carbon Partnership Facility and the UN REDD Programme will provide secretariat services.
- It was stressed at the conference that the partnership would be consistent with negotiations under the UNFCCC.
- Objective of the partnership is: *"…. to contribute to the global battle against climate change by serving as an interim platform for the Partners to scale up REDD+ actions and finance, and to that end to take immediate action, including improving the effectiveness, efficiency, transparency and coordination of REDD+ initiatives and financial instruments, to facilitate among other things knowledge transfer, capacity enhancement, mitigation actions and technology development and transfer."*

Thanks for listening

Global Carbon Markets Team - International Climate Change Division

nasrine.amzour@decc.gsi.gov.uk

Tel (from abroad) 0044 207 979 7777 (extension 5398)

Mobile: +44 (0)7920087000