

11 Carbon markets, 2011-2012

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Highlights

- The volume of carbon traded in the global markets grew by 17% to 10.2 billion tonnes of CO₂e in 2011, with its value increasing to \$175.6 billion – a 10% increase from 2010.
 - The first Reducing Emissions from Deforestation and Forest Degradation (REDD) credits entered voluntary carbon markets in February 2011.
 - Development of a market-based REDD mechanism continued in April 2012 when the first REDD credits were issued in Brazil as temporary Certified Emission Reductions (CERs).
 - Despite the overall growth, carbon trade has been slow to take off, having suffered from the prolonged financial and economic crises in Europe, political obstacles in the US, slow progress in the negotiation process of the United Nations Framework Convention on Climate Change (UNFCCC), and the absence of full operational details for REDD+.
 - The EU Emissions Trading System grew by 11% to \$147.9 billion in 2011, and represents 78% of world trade.
 - Although the volume of the voluntary carbon market (VCM) dropped by 28% to 95 million tonnes of CO₂e, the value increased by 33% to \$576 million.
 - Since June 2011, 11 new afforestation/reforestation projects with a total area of 26,350 ha were approved under the Clean Development Mechanism (CDM) to offset 300,100 tonnes of CO₂e.
 - REDD+ negotiations focused on: Safeguards; Measurement, Reporting and Verification (MRV); Reference Emission Levels (REL); and financing.
 - Several countries are preparing to launch their national emission trading schemes with full market mechanisms by 2015 (e.g. Australia, China, Republic of Korea).
 - California's Air Resources Board formally adopted the State's greenhouse cap-and-trade programme, which started in January 2012.
 - The future of the climate change negotiations hinges on the success of the Durban Platform for Enhanced Action (ADP), which pledged to create a legally binding climate treaty applicable for all countries.
 - The second compliance period of the Kyoto Protocol starts as a voluntary agreement in 2013, and is characterized by a lack of interest outside Europe for a binding treaty (Canada, Japan, the Russian Federation and the US do not intend to commit).
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11.1 Introduction

This chapter builds on its counterparts in the three previous *Forest Products Annual Market Reviews*¹⁴. It provides updates on the developments both in compliance and in voluntary carbon markets. It sets out the key market indicators and policy developments, and discusses the most important national start-ups.

For readers who may not be familiar with the different trading schemes and the main political and economic drivers of the carbon markets, it may be helpful to refer to those previous chapters.

Our aim is to concentrate on the forest-based carbon market segment; although the size of this segment has remained marginal in comparison with total greenhouse gas trade.

The general methodology for reporting on carbon trade is not completely standardized. We have tried our best to seek consistency in describing the market size. We would like to point out one methodological change from previous years. The much-increased secondary CDM market includes not only secondary Certified Emission Reductions (sCER) but also secondary Emission Reduction Units (sERU), and other spot and secondary offsets.

Phase 1 of the Kyoto Protocol¹⁵ expires at the end of 2012. Until a new agreement is reached, the Protocol is under “provisional application”. Fewer countries are expected to participate in the second commitment period¹⁶ than did in the first (which were mainly European). Australia and New Zealand are yet to commit. One of the major outcomes of the climate conference COP-17 in Durban, South Africa, was that countries agreed to negotiate a legally binding agreement¹⁷ by 2015.

The general economic situation and vague results of climate change negotiations resulted in low activity on carbon markets. Within voluntary carbon markets, activity remained relatively sluggish. Efforts are nevertheless being made to revive and improve these markets. For example, the REDD (Reducing Emissions from Deforestation and Forest Degradation) programme issued credits to the voluntary carbon markets for the first time in 2011.

¹⁴ These publications are available at: www.unece.org/forests

¹⁵ Kyoto Protocol Phase 1: 191 States have ratified (US not included).

¹⁶ Kyoto Protocol Phase 2, Canada, Japan, the Russian Federation and the US are not participating (UNFCCC, 2012a).

¹⁷ Durban platform: an agreement to formalize a legally binding commitment to reduce emissions by 2015. The agreement will be put in place in 2020.

11.2 Market outlook

11.2.1 Total carbon market size

In 2010-2011, the global carbon market increased in value from \$159 billion to \$175.6 billion (table 11.2.1). The volume grew from 8.7 billion tonnes CO₂e to 10.2 billion tonnes CO₂e. The growth originated from the EU-Emissions Trading System (EU-ETS), the Secondary Clean Development mechanism (sCDM) and Over-the-Counter (OTC) markets. All other market segments declined.

The 27 EU countries will participate in the second compliance period of the Kyoto Protocol, and prospects for the future of the EU-ETS are better than for many other markets. The EU-ETS continues to grow, with many new sectors joining it.

In this chapter, sCDM volumes and values include secondary Certified Emission Reductions (sCERs), secondary Emission Reduction Units (sERUs), as well as other spot and secondary offsets. This is a methodological change from previous reports, where only sCERs were reported. Here, 2010 and 2011 include both sCERs and sERUs. Interest in sCER has increased because the delivery risk is smaller and the credits are easier to obtain than with project-based primary CERs.

Uncertainty in the future of CDM and Joint Implementation (JI) and how these allowances transfer to the post-2012 period has contributed to the decline in their primary markets. Weak industrial activity has caused a drop in emissions, especially in Europe. The high volume of European Union Allowances (EUAs) available negatively affects the price and demand for CERs under EU-ETS (afforestation/reforestation CERs are not eligible for EU-ETS trade).

The first commitment period of the Kyoto Protocol closes at the end of 2012. The CDM has started to adapt to the new period by relabelling CERs into post-2012 CER and pre-2013 CER, on the basis of time when the CERs were issued. Pre-2013 CER refers to credits issued during the first commitment period of the Kyoto Protocol. Only post-2012 credits will be transferred to the second compliance period of the Kyoto Protocol.

Primary CDM markets (pre-2013) declined from 124 million tonnes of CO₂e to 91 million tonnes CO₂e, while the post-2012 primary CER market grew to 173 million tonnes of CO₂e in 2011 (worth \$1,990 million). Joint Implementation markets dropped from 41 million tonnes of CO₂e to 28 million tonnes of CO₂e.

OTC transactions helped the voluntary carbon markets grow in value only. OTC market includes voluntary market transactions that are not part of a regulatory cap-and-trade system. OTC grew \$154 million in value to \$576 million. Simultaneously, the volumes

decreased from 128 million tonnes of CO₂e to 95 million tonnes. The voluntary carbon market failed to maintain its positive momentum of the last couple of years, and is now stagnating at best.

TABLE 11.2.1
Carbon markets 2010-2011

Market segment	2010		2011	
	Volume million tonnes CO ₂ e	Value million \$	Volume million tonnes CO ₂ e	Value million \$
Project-based transactions subtotal:	165	1 988	119	1 329
Primary CDM				
pre-2013	124	1 458	91	990
post-2012	100	1 217	173	1 990
Joint Implementation (pERUs)	41	530	28	339
Voluntary markets				
subtotal:	132	433	95	576
OTC	128	422	95	576
CCX ¹	2	0.2	0.2	0.06
Other Exchanges	2	11	2	4
Secondary CDM	1 275	20 637	1 822	23 250
Allowances markets				
subtotal:	7 061	134 682	8 024	148 467
EU-ETS	6 789	133 598	7 853	147 848
NSW ²	na	na	na	na
RGGI ³	210	458	120	249
AAUs market	62	626	47	318
Alberta's SGER ⁴	4	56	4	51.5
Total carbon markets	8 733	158 957	10 233	175 612

Notes: Data has been adjusted with Ecosystem Marketplace and Bloomberg New Energy Finance:

Developing Dimension: State of the Voluntary Carbon Markets 2012.

¹ Chicago Climate Exchange (the USA, closed 31.12.2010). Values include delisting values of Chicago Climate Future Exchange.

²New South Wales (Australia).

³Regional Greenhouse Gas Initiative.

⁴Specific Gas Emitters Regulation of Alberta, Province of Canada.

Sources: The World Bank 2012: State and Trends of the Carbon Markets 2012. Ecosystem market place and Bloomberg New Energy Finance. 2012: Developing Dimension: State of the Voluntary Carbon Markets 2012.

The Chicago Climate Exchange (CCX) closed at the end of 2010, as there were no prospects for passing the mandatory cap-and-trade scheme in the US. The same year, the Intercontinental Climate Exchange (ICE) acquired the Chicago Climate Exchange, along with the Chicago Climate Futures Exchange (CCFE). The CCX values in table 11.2.1 represent the values after the

delisting of the Chicago Climate Futures Exchange. All the contracts were delisted at CCFE by 28 February 2012 (CCFE, 2012). CCFE was closed because of economic losses after a federal carbon-reduction plan was dropped. (Sustainable Business, 2012).

The Regional Greenhouse Gas Initiative (RGGI), North America's first compliance market, was launched in 2008 with the aim of reducing power sector CO₂ emissions by 10% by 2018. Currently, nine States are participating. The first of its three compliance periods, which ended in 2011, was characterized by a significant over-allocation (The World Bank, 2012a). This was due to emissions estimates and reference levels being set too high, causing an oversupply of allowances and leading to low prices and weak trading.

11.2.2 Regulatory carbon markets

11.2.2.1 EU Emissions Trading System

The EU Emissions Trading System (EU-ETS) registered an increase of \$14.2 billion in 2011 over 2010, coming from one billion tonnes more of CO₂e traded. The European Union Allowances, or EUAs, are the tradable units under the EU-ETS. One EUA is equivalent to one tonne of CO₂e. EUAs accounted for 81% of all transactions under the EU-ETS. As of 2013, the aviation sector will also be included. It will be the second largest industry in the system after the power sector.

Europe's pulp and paper industry has participated in the EU-ETS since 2005. Until now, the free emission allowances granted to the industry were enough to meet most of the commitments. The industry is likely to engage more on trade of EUAs after the beginning of 2013, when Phase 3 of the EU-ETS begins.

The EU's Energy Efficiency Directive targets a 20% cut in primary energy consumption by 2020 (based on 1990 levels), which will affect carbon credit prices in the future (The World Bank, 2012a). The aim is to save energy and reduce GHG emissions in the EU, resulting in lower demand for allowances and hence, lower carbon prices.

11.2.2.2 Clean Development Mechanism

The Clean Development Mechanism (CDM) encourages project-based emission-reduction activities in developing countries. The tradable unit is the Certified Emission Reduction (CER), which is the equivalent of one tonne of CO₂e.

The primary CERs (pCER) are the first sale made directly by a project developer. Secondary CERs (sCER) are traded onwards, for example at exchanges. ERU is the tradable unit of Joint Implementation. "Primary CER have

a delivery risk while secondary CER are already generated and issued by the CDM Executive Board and are hence risk-free" (Point Carbon, 2008).

The value of primary (pre-2013) CDM trade declined 32% from \$1,458 million to \$990 million. The secondary CDM market value increased from \$20.6 billion to \$23.3 billion (table 11.2.1). The volume of secondary CDM increased by 43%, from 1,275 million tonnes of CO₂e in 2010 to 1,822 million tonnes of CO₂e in 2011.

About 8,500 CDM projects have been started since 2003 and there are currently about 3,500 CDM projects in the validation process. In 2011, 859 new projects entered the CDM pipeline (The World Bank, 2012a).

How the CDM market will develop is hard to predict. We see no consensus on types of project to be accepted under CDM after 2012. EU-ETS will accept new CERs only if they are produced in least-developed countries (LDC) in the post-2012 period. Only the last year's contract volumes and values are transferred to the second period. The evolution of national trading schemes may also diminish the importance of the CDM. The Asia-Pacific region accounted for 51% of primary CDM projects (The World Bank, 2012a).

11.2.2.3 Joint Implementation

Joint Implementation is a flexible mechanism under the Kyoto Protocol designed to help developed countries meet their emission reduction targets. It allows generating emission reduction units (ERU) in a country that is classified as an Annex B country/economy. Annex B refers to the emission-capped industrialized countries and economies and countries in transition, as listed in the Kyoto Protocol (FPAMR, 2010-2011).

There was reduced activity in the Joint Implementation scheme in 2011, with volume falling by 32%, from 41 million tonnes of CO₂e in 2010 to 28 million tonnes of CO₂e and the value from \$530 million to \$339 million.

The second commitment period of the Kyoto Protocol will allow continuation of Joint Implementation. In an effort to improve transparency and credibility, the Joint Implementation Supervisory Committee took advice from several non-governmental organizations during the 14th United Nations Framework Convention on Climate Change (UNFCCC) on how the mechanism might be improved. The Committee aims to standardize the emission reduction unit (ERU) verification procedure, which has two tracks. Track 1 holds the host party responsible for verifying emission reductions, whereas in track 2 the responsibility rests with the Supervisory Committee. Responsibility for ERU issuance in future will be centralized with the Supervisory

Committee, accordingly track 2 will be the only procedure to verify ERUs (UNFCCC, 2012a).

As of May 2012, 570 joint implementation projects are at different stages of development (The World Bank, 2012a). The majority are in the Russian Federation and Ukraine, accounting for 76% (98 million) of the 131 million ERU issued to date.

During 2011, two new forestry-related projects were implemented or updated. Ukraine started a project using waste wood to substitute for natural gas and Bulgaria is initiating a new biomass project where wood is used together with straw for energy production (UNFCCC, 2012a).

11.2.2.4 Other compliance markets

An assigned amount unit (AAU) is equivalent to one tonne CO₂. Annex B countries/economies have received an allocation of AAU for the total volume of greenhouse gases they are permitted to emit during the first Kyoto Protocol period. Countries that reduce their CO₂ emissions below the targets set by the Protocol may sell those "spare" units to other countries that are unable to do so.

AAU markets declined in 2011, with the volume traded falling 24% from 62 million tonnes of CO₂e to 47 million tonnes of CO₂e, with the value dropping from \$626 million to \$318 million. The principal uncertainties concern "the adoption of quantified emission limitation or reduction objectives (QUELROs), the length of the second commitment period (2017 or 2020), and whether and how AAU from the first commitment period can be transferred to the second" (The World Bank, 2012a).

11.2.2.5 Forest carbon in the Clean Development Mechanism

Table 11.2.2 lists the afforestation/reforestation (A/R) projects developed or registered since the publication of the *Forest Products Annual Market Review, 2010-2011*. The Bagepalli CDM reforestation programme in India was registered in June 2011 and now has a total of 39 projects under way (UNFCCC, 2012b).

If its 11 new projects from 2011 are registered, verified and their credits issued, a total of 300,100 tonnes of CO₂e will be mitigated. The area covered by the new projects is 26,350 hectares, significantly lower than in earlier years. Forestry projects are long-term in nature and the uncertainty about the CDM continuing after 2012 has had a negative effect on interest in bringing new projects into the mechanism. The credits generated by another country (see other parties from table 11.2.2) could be excluded if the hosting country does not ratify the second compliance period of the Kyoto Protocol.

TABLE 11.2.2

CDM forestry projects registered since July 2011

Title and year registered	Host parties	Other parties	Reduction in CO ₂ e
Bagepalli CDM Reforestation Programme	India		92 103
Commercial reforestation on lands dedicated to extensive cattle grazing activities in the region of Magdalena Bajo Seco (2011)	Colombia		32 965
Aberdare Range/ Mt. Kenya Small Scale Reforestation Initiative Kamae-Kipipiri Small Scale A/R Project (2011)	Kenya	Canada, Italy, Luxembourg, France, Japan, Spain	8 542
Uganda Nile Basin Reforestation Project No.5 (2011)	Uganda	Italy, Luxembourg	5 925
Reforestation of degraded land by MTPL in India (2011)	India		146 998
Uganda Nile Basin Reforestation Project No 2 (2011)	Uganda	Italy, Luxembourg	4 861
Uganda Nile Basin Reforestation Project No 1 (2011)	Uganda	Italy, Luxembourg	5 881
Uganda Nile Basin Reforestation Project No 4	Uganda	Italy, Luxembourg	3 969
Aberdare Range / Mt. Kenya Small Scale Reforestation Initiative Kirimara-Kithithina Small Scale A/R Project (2011)	Kenya	Canada, Luxembourg	8 809
Securization and carbon sinks project (2012)	Chile	Spain	72 019
Aberdare Range/ Mt. Kenya Small Scale Reforestation Initiative Kibaranyeki Small Scale A/R Project *	Kenya	Canada	7 427
Oceanium mangrove restoration project *	Senegal	France	2 704

Notes: Estimated emission reductions in metric tonnes of CO₂ equivalent per annum as stated by project participants.

* Requesting Registration.

Source: UNFCCC, CDM database, 2012b.

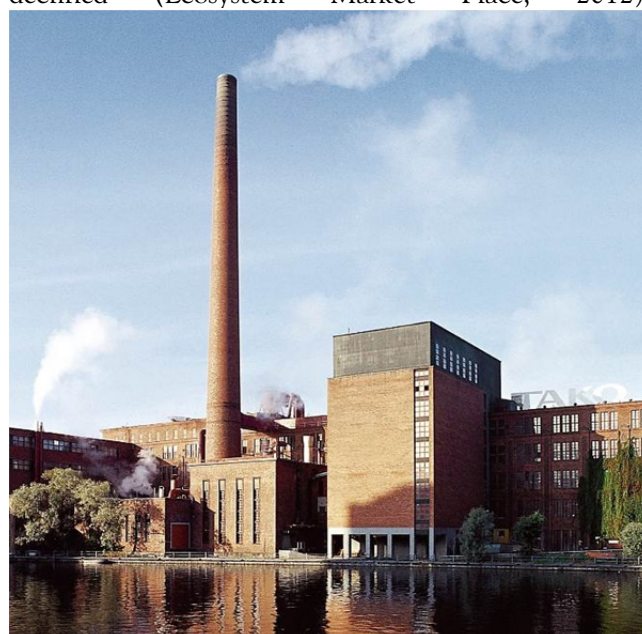
In Africa, many projects were registered in 2011-2012 in two key regions – the Nile Basin in Uganda and the Aberdare Range/Mt. Kenya region. In terms of CO₂ reductions, India kept the lead with 239,000 tonnes

CO₂e. In comparison South America reduced CO₂ emissions by 105,000 tonnes. From 2009 to 2011, South America was the most attractive region for CDM projects. One of the main drivers attracting CDM projects in a country is its emission-reduction potential (UNIDO, 2003). Other factors include the institutional capacity of host projects (e.g. stable economy and advanced technology) and the general investment climate (Jung, 2005).

The most active countries participating in CDM projects registered since July 2011 were Canada, Italy and Luxembourg. Canada participates in three projects hosted by Kenya. Italy and Luxembourg have concentrated their participation on Uganda’s Nile Basin region, where they are involved in three projects. The industrialized countries participating in the projects buy the CERs generated by the projects to meet their emissions reduction requirements, while lending technical support to the host countries for developing the CDM project.

11.3 Voluntary carbon markets

The total volume traded in the voluntary carbon market in 2011 fell by 28% from 2010 to 95 million tonnes of CO₂e, although the value rose by 33% to \$576 million. North America was the most attractive location for OTC transactions, trading 37% of total volume, with a value of \$178 million. The trade also grew in Asia, Europe and Oceania, but in Latin American and non-EU European countries the market declined (Ecosystem Market Place, 2012).



Source: Metsä Group, 2012.

Voluntary markets that are not driven by emission caps are sometimes criticized for lack of clear rules and unequal regulation. We can nonetheless find a variety

of standards and policies among both voluntary and compliance markets that often overlap with other environmental and social-economic standards and some are used parallel to each other. However, several standards are considered to be close to equal with the compliance market mechanisms. Where an independent party verifies reduction units, this is referred to as a third-party standard. In the voluntary carbon markets, the third-party standard accounts for 98% of all transactions.

The Verified Carbon Standard (VCS) occupies the leading position, with 41 million tonnes of CO₂e. In second place comes the Climate Action Reserve (CAR) with 9 million tonnes of CO₂e, followed by the Gold Standard. The Gold Standard is used in the CDM, joint implementation and voluntary markets. In 2011, the Gold Standard expanded its area of operation into land use and forestry (The Gold Standard, 2012). In 2011, country-specific standards accounted for 7% (6 million tonnes of CO₂e) of all VCM transactions (Ecosystem Market Place, 2012).

11.3.1 Forest carbon and REDD in the voluntary carbon market

Verified Carbon Standard (VCS) forestry projects that have issued or registered Verified Carbon Units (VCUs) since the publication of the 2010-2011 *Forest Products Annual Market Review* are listed in table 11.3.1.

There were four new REDD projects registered in the voluntary carbon market, of which two were validated (details are not available in table 11.3.1). REDD credits are slowly being piloted in carbon markets. In February 2011, the first verified REDD credits were issued under VCS in Kenya. REDD as a market-based mechanism continued developing, with the first forestry credits being issued in April 2012. Four million temporary CERs were issued in a reforestation project in Brazil (The World Bank, 2012a).

Steps towards a transparent REDD crediting scheme in the marketplace were taken in 2011. The VCS, other REDD project developers and groups setting third-party standards are working under the political and technical challenges of the REDD credit verification process. The VCS provided methodological and technical guidance for REDD project verifiers in early 2012. REDD projects and carbon markets are being hampered by challenges in complex regulation, financing and the lack of compatibility between different regional and national markets (Ecosystem Marketplace, 2012). REDD governance and benefit-sharing safeguards are seen as crucial areas of further development.

REDD projects accounted for 7.3 million tonnes of CO₂e in 2011. (Ecosystem Market Place, 2012).

TABLE 11.3.1

Voluntary carbon market forestry projects under the Verified Carbon Standard

Project name	Host parties	Project proponent	Estimated VCUs	Registration date	Area influenced (ha)
Alto Huayabamba	Peru	Pur Project	28 756	March-12	na
Bukaleba Forest Project	Uganda	Multiple project proponents	11 903	March-12	2 061
Bull Run Overseas Forest Carbon Project	Belize	The Aldebaran Company	12 315	April-12	666
Carbon Project in the Emas-Taquari Biodiversity Corridor, Goiás and Mato Grosso do Sul, Brazil	Brazil	Oreades Nucleo de Geoprocessamento	6 870	December-11	589
Reforestation Across the Lower Mississippi Valley	United States	Dynergy Inc.	101 874	February-12	12 789
Reforestation of degraded land in Chhattisgarh, India	India	Prakash Industries Limited	5 007	October-11	na
Reforestation of pastures in Sociedad Agrícola de Interés Social "José Carlos Mariátegui" - Joven Forestal Project, Perú	Peru	SAIS José Carlos Mariátegui	31 737	December -11	1 450
TIST Programme in Kenya, VCS 005	Kenya	Clean Air Action Corporation	86 694	December -11	2 556

Source: VCS Project Database, 2012.

As well as those under VCS, several other forest carbon projects exist. The Climate Community and Biodiversity Alliance (CCBA) is a partnership of research institutions, corporations and NGOs active in forestry projects (CCBA, 2012). It has increased its activities significantly since 2011. In May 2012, it had a total of 81 projects, an increase of 21 since May 2011. South America has the greatest area, with 31 projects, and Africa is the second most active region, with 21 projects. The US and Canada both introduced one additional project, making the total number of projects in the US seven and in Canada three.

Carbon Fix, a German non-profit organization fostering forestation projects through its own standards, has 11 projects, covering 22,199 hectares (Carbon Fix, 2012). Plan Vivo, the offset for small-scale LULUCF projects (Land Use and Land Use Change in Forestry), increased its registered projects from three to seven between 2011 and 2012 (Plan Vivo, 2012).

BioCarbon Fund. The BioCarbon Fund (BioCD) was created by the World Bank in 2004 to “mobilize resources for pioneering projects that sequester or conserve carbon in forest or agro-ecosystems” (FPAMR, 2011). It slowed activity in 2011 compared with 2010. The number of countries being supported fell from 16 to 13 and the number of projects from 21 to 15. The total number of Emission Reductions (ERs) dropped from 8.6 million tonnes of CO₂e to 6.2 million tonnes of CO₂e. Projects that have not been validated but are contracted for purchase create ERs. ERs can be created under CDM or joint implementation projects.

11.4 Carbon prices

The EUA and CER daily spot prices for traded carbon fell between July 2011 and May 2012. There were two clear price peaks in EUA: the first in September 2011 and the second in March 2012 (graph 11.4.1). The EUA fell from \$13 to \$6 per tonne. The per tonne price of CER followed the same declining trend, falling from \$11 to \$4 by May 2012.

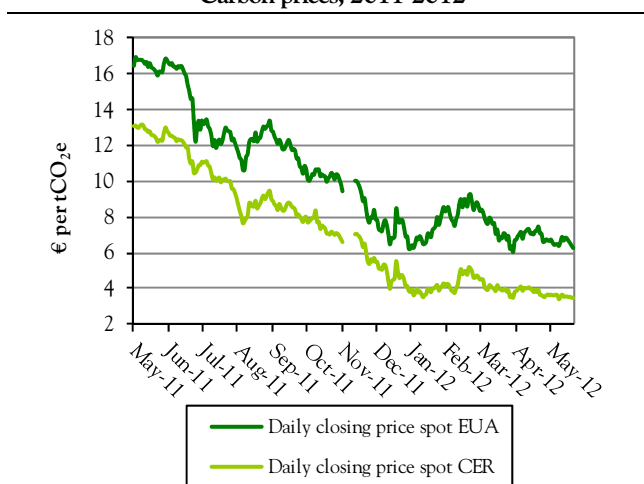
The European carbon price is not high enough to meet Europe’s future emission goal. Prices dropped rapidly between July 2011 and January 2012. However, the Durban negotiations in late 2011 helped them stabilize, having boosted confidence that a new global climate agreement might be possible.

Recession and imported credits from outside the EU are holding prices down. Prices are also affected by the Energy Efficiency Directive, which aims for a 20% reduction in primary energy consumption by improving technology. The improved technology and prolonged economic uncertainty cause reduced demand for allowances, which leads to lower prices in the long term. In general, prices are

being held down by the uncertainties surrounding the state of the global economy, resulting in lower emissions, and vague results from climate change negotiations (leaving room for interpretation).

GRAPH 11.4.1

Carbon prices, 2011-2012



Note: The price data were not available in early November 2011 because Bluenext exchange was closed. This was due to maintenance of the international UN carbon trade log.

Source: BlueNext, 2012.

11.5 Policy discussion

11.5.1 The 17th Conference of the Parties (COP-17) to the UNFCCC in Durban

The COP in Durban achieved a global consensus on continuing work to secure a commitment to reducing emissions and achieving a legally binding climate convention in the future.

The three main outcomes to support a global climate convention were:

- Agreement on the second commitment period of the Kyoto Protocol. The fundamental decision concerning the Kyoto Protocol second commitment period would be addressed at COP-18 to bring the second period into reality.
- A Green Climate Fund will focus on long-term financial support for developing countries, helping them to set up climate change mitigation projects and attract private-sector funds.
- Agreement to negotiate a global legally binding climate agreement by 2015. This formal condition agreed by countries that participated in the COP-17 is also known as the Durban Platform. The Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) is a subsidiary body responsible for drawing up the legally binding agreement. The purpose of the working group is to

agree “only” on mitigation matters. However, some of the parties required that financing, adaptation, capacity building and technology transfer should also be within the ADP mandate.

Work has started on defining guidelines on information to be included in National Adaptation Plans (NAP). Agreement was reached on developing general guidelines for Measurement, Reporting, and Verification (MRV) of carbon accounting. The parties also agreed to include carbon capture and storage (CCS) as an eligible CDM project activity.

The agreement on the next phase of the Kyoto Protocol specifies neither a time frame nor a responsible body for carrying out the work to implement the decisions. Until a new agreement has been negotiated, the protocol is a “provisional application” i.e. voluntary. The commitment period started at the beginning of January 2012 and will expire either at the end of 2017 or 2020, depending on the success of future negotiations.

Only the EU-27 countries plus Iceland, Norway and Switzerland are likely to participate in the second commitment period. Croatia will join once it becomes a member of the EU, but Canada, Japan, the Russian Federation and the US do not intend to commit. Australia and New Zealand have yet to confirm their intentions (UNFCCC, 2012a).

11.5.2 Bonn Climate Change Conference

The Bonn Climate Change Conference of the UNFCCC was held in May 2012 to address the current challenges in preventing climate change. The climate change negotiations have been slow and complex. The situation today is far from resembling the objective set by the UNFCCC in 1992 (ENB, 2012). The challenges of a changing world have undeniably complicated the process. UNFCCC was formed expecting to categorize countries easily between Annex 1 and non-Annex Countries. Some developing countries, i.e. parties of non-Annex Countries, are thought to benefit from looser emission regulation. The US raised this issue in relation to China, proposing that stricter climate measures should apply to China before the US would agree to sign a legally binding agreement. Developed countries are eager to find a solution that better aligns the goals and commitments of developing and developed countries.

About 40 countries from Asia, Latin America and the Middle East pursued the Convention’s principles of common but differentiated responsibilities and equity. The developed countries meanwhile are seeking the ‘Beginning of a new paradigm for responding to climate change’ that is legally binding and applicable to the entire world.

The role of agriculture was finally acknowledged, but the expansion of global climate mitigation measures to the broad agricultural sector was not thought feasible until existing protocols had been proven effective.

The negotiations did, however, produce improvements in some technical issues related to measurement, reporting and verification (MRV) in tropical forests, though only in the most general terms. Details of the reference levels against which carbon emission reduction will be measured have still to be discussed. A “stepwise approach” has been adopted, allowing forest-rich countries to start with simple accounting methods that develop gradually towards a more reliable accounting system.

Discussion about the implementation and content of the second phase of the Kyoto Protocol continued at the Bonn meeting, but no final agreement was reached.



Source: A. Nygren, 2010.

11.5.3 Highlights of REDD+ related negotiations in 2011-2012

11.5.3.1 REDD+ discussion at COP-17 Durban

Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. “REDD+” goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.

The REDD+ negotiations in Durban (Forest Carbon Asia, 2012) had four main areas of focus. The first was on safeguards, and the second on development of a Measurement, Reporting and Verification (MRV) process development. It was decided that countries needed to report on how decisions are implemented. There are currently neither penalties for failures nor rewards for

successes. There is also no obligation for countries to report on results.

The third focus was on reference emission levels. The conference discussed the historical rate of deforestation, projections on forest-area development and national macro-economic, institutional and social circumstances. It did not bring a change to previous practice, where countries can choose their reference levels. The levels are adapted to national circumstances, and the objective is not to slow down economic development in countries.

The fourth focus was on the REDD+ financing mechanism. Both market-based and non-market-based mechanisms were discussed, but no decisions were made on the final form of financing. This would be discussed at COP-18 later in 2012. The Green Climate Fund was recognized as a major source of financing.

The conference called for long-term financial commitments from both the public and the private sector. Negotiators from developing forested countries wanted consensus on structure and governance during this conference, initiating the indicated \$100 billion/year income stream from developed countries to developing countries for climate change mitigation and adaptation by 2020 (CIFOR, 2012). However, the strategy on how and where to collect the funds remains ambivalent.

The possibility of developing a market-based mechanism in the coming years was also discussed. Developing a market-based mechanism for financing REDD would enable projects other than ones on afforestation and reforestation to be introduced under CDM land use activities (The World Bank, 2012b).

The significance of REDD+ for developing countries was again emphasized. It was claimed that the current structure of funding, based on bi- and multilateral relationships, caused an unequal allocation of funding to developing countries (CIFOR, 2012).



Source: Metsä Group, 2012.

Discussion continued about how REDD+ could achieve its purpose. A simplistic view would be to ban logging, or to manage forests for non-timber products using a “payment for ecosystem services” approach. Another approach could be to create carbon plantations, which aim to produce carbon-neutral timber through proper accounting of storage and release. Plantation management, in some circumstances, could cause environmental degradation and cultural problems, i.e. unclear land tenure rights, destruction of pristine rainforests or other carbon-rich natural forests. The debate continues about the applicability of monitoring the carbon balance and use of plantation forestry under REDD+.

11.5.3.2 REDD+ discussion at the Bonn Climate Change Conference

REDD+ is part of the solution for achieving the target of limiting the rise in global temperatures to less than two degrees centigrade. The procedures for financing REDD+ were considered. There was support for allocating a significant share of the Green Climate Fund to REDD+, as well as for considering alternative financing solutions. One approach was to develop a market-based mechanism that excluded generating offsets. Another was to develop mechanisms that were not market-based. Establishing national registries to account for verified emission reductions was also discussed.

Parties agreed on the following priorities in the REDD+ development process. The emphasis will be put on:

- Measurement, Reporting and Verification (MRV).
- National Forest Monitoring Systems (NFMS).
- Discussion about drivers of deforestation and forest degradation.

(CLIM-FO, 2012)

11.6 National and regional carbon market developments

11.6.1 Overview

Despite low carbon-market prices in 2011/2012, regional and national carbon-market initiatives sprung up in both developing and developed countries. Five new cap-and-trade schemes were being set up during 2011-2012:

- The Australian parliament announced the Australian Clean Energy Act.
- The California Air Resource Board (CARB) adopted cap-and-trade regulation scheme.
- The province of Quebec started its own cap-and-trade programme.

- Mexico passed wide-ranging climate bills providing a firm basis for a market-based mechanism.
- The Republic of Korea passed legislation similar to that of Mexico.

11.6.2 North America

In October 2011, California's Air Resources Board (ARB) formally adopted the State's greenhouse cap-and-trade programme, which started in January 2012. The auction for these credits is to be held in August 2012. In 2010 there was an attempt to defer the law behind the programme. The cap-and-trade system was threatened after California's low-carbon initiative had earlier been judged unconstitutional. The initiative was re-established in April 2012 (Ecosystem Market Place, 2012).



Source: Thomas D. 'Tom' Landis, USDA Forest Service.

Quebec is the first Canadian province to have developed a cap-and-trade programme, which will start in 2013. A one-year transition period will allow the largest industrial emitters to move to the new system. The programme targets a 20% reduction in GHG emissions from 1990 levels by 2020. (The World Bank, 2012a; American Carbon Registry).

Shared regional carbon market. California and Quebec are working towards a shared regional carbon market. Even though both markets were developed by Western Climate Initiative applying the same guidelines, further rule-making and technical revision is needed to make them compatible with each other. For example, Quebec approves three offset types, two of which are not accepted by California. However, California could approve offsets derived from forestry activities.

A proposal to link Quebec and California's regulations was submitted for consideration in California on 28 June 2012 with related actions in Quebec at the same time. However, the first joint auction, scheduled for 14 November 2012, was cancelled in late June 2012 and California is holding the auction without Quebec (Point Carbon, 2012a). The auction was retracted because

further revision of the programmes is needed to treat allowances from both programmes identically. The decision on linking the programmes was postponed for the time being. By 2014, Quebec and California would together create an offset demand of 27.5 million tonnes of CO₂e (Point Carbon, 2012b).

American Carbon Registry, a non-profit voluntary offset programme, registers voluntary carbon market projects that meet either its own standards or California ARB compliance offset protocols. It has applied to ARB to be accepted into the Californian compliance markets. About 8% of an estimated 200 million tonnes of CO₂e emission obligations in the new cap-and-trade market could possibly be met with ARB credits from 2013-2020.

The Regional Greenhouse Gas Initiative (RGGI) is the first cap-and-trade programme in the US aimed at reducing GHG emissions by 10% below the 1990 level by 2018. It covers only emission reductions from power plants. When it was launched in 2009, ten north-eastern States participated; but in late 2011 the State of New Jersey left the Initiative.

RGGI held its sixteenth allowance auction in June 2012, when it offered 21 million 2012 allowances. The auction generated \$40.4 million, bringing the cumulative action sales value to over \$1 billion (World Energy, 2012). The next auction is due in September 2012.

11.6.3 New Zealand

New Zealand Emissions Trading Scheme (NZ ETS) is the only operational national carbon-trading scheme outside Europe. Its review report, released in September 2011 states that emitters are obliged to acquire one permit for every two tonnes of GHG emissions released. The allowances are traded in New Zealand Units (NZU). One NZU is equivalent to one tonne of GHG emissions.

Another option for compensating for emissions is paying a fixed NZ\$ 25 (\$20.25) for each tonne of GHG emissions. The price will increase by NZ\$ 5 per year until 2017, when a revision will be needed. The agricultural sector is due to join the scheme in 2015. Currently, the scheme operates only domestically – forestry being an exception, as credits created by the forestry sector may be traded overseas (Reuters, 2011).

The government introduced the Permanent Forest Sink Initiative (NZ PFSI) in 2008 to promote the establishment of forest on previously non-forested land. It complements NZ ETS and landowners can participate in both.

11.6.4 Australia –carbon market initiative and carbon tax

The Australian government approved the Carbon Farming Initiative. This Initiative regulates the creation

and trade of carbon units from farmland and forestry projects. It promotes the establishment and management of permanent native forests on previously cleared or partially cleared lands.

Australia decided to introduce a fixed-price carbon tax as of 1 July 2012, moving to a cap-and-trade ETS on 1 July 2015. The cost of released CO₂ is initially set at AU\$ 23 and will increase gradually until 2015, when the market can set the price through ETS. The scheme will cover about 60% of the country's 600 million tonnes of CO₂e annual emissions (The World Bank, 2012b).

11.6.5 Republic of Korea

On May 2012, the Republic of Korea passed an emission trading law after a one-year review. This act (Low Carbon and Green Growth) enables a legal entity to implement policies and measures for reaching the country's green development pledges. A 30% reduction in GHG is expected by 2020, compared with the business-as-usual scenario.

A system has been put in place to support the necessary infrastructure and MRV-system for implementing the emission-trading scheme. By 2014, ETS will cover parties that emit over 50,000 tonnes of CO₂e, and the trading scheme will start in 2015.

11.6.6 Japan

Japan hosts two domestic credit systems: Japan Verified Emission Reduction (J-VER) scheme and Japan Clean Development Mechanism (J-CDM). In 2011, the total value of these schemes grew to \$17 million (Ecosystem Marketplace, 2012). After the tsunami and the Fukushima nuclear power plant accident, Japan has been relying on foreign offsets because the country has used carbon fuels as substitute for the power shortage caused by the accident.

Bilateral Offset Crediting Mechanism. The Ministry of the Environment has taken the initiative to support a new market mechanism. The purpose of the Bilateral Offset Crediting Mechanism (BOCM) is to contribute towards global emission mitigation, aligning with the mission of UNFCCC, by providing a mechanism for bilateral cooperation that serves global climate change policy and is adaptable to each country's circumstances (table 11.6.1).

It aims at promoting sustainable development in developing countries, restricting GHG emissions at the least cost. It also promotes low-carbon technologies, products and services and enhanced capabilities to utilize them. It spreads know-how for low-carbon technology, electricity-saving technology, new energy technology and coal-fired power in order to find mitigation potentials.

These attributes have not yet been fully evaluated under the current Clean Development Mechanism.

Japan has made joint statements with India, Indonesia, Thailand, Viet Nam and the Mekong region, and the number of projects is increasing. Current REDD+ feasibility studies are listed in table 11.6.1. These projects have three different tasks. They are used for (a) identifying the most suitable project types for different countries and regions, (b) evaluating Japan's potential to contribute towards GHG mitigation objectives via the new programme and (c) developing a more flexible mechanism to replace the CDM (MOEJ and GEC, 2012).

TABLE 11.6.1

REDD projects under BOCM

Host country	Project
Angola	REDD+ through revegetation and producing fuel of woody biomass chips
Brazil	REDD+ in Acre State
Cambodia	REDD+ in Pre Long area
Indonesia	REDD+ in Central Kalimantan Province REDD+ and biofuel production Utilization Avoidance of peat aerobic digestion and rice-dusk-based power generation
Viet Nam	REDD+ through re-vegetation at Denuded Lands and woody-biomass-based power generation in Son La Province

Source: New Mechanism Information Platform, 2011.

11.6.7 China

The world's largest emitter, China has set a goal to establish a domestic emissions trading scheme by 2015 to replace its seven regional trading schemes. Merging the subnational markets will be a challenge, and it is unlikely that the trade can be opened on such a tight schedule. The launch of the scheme is estimated to be delayed at least for a year (Financial Review, 2012)

China is the largest source of Certified Emission Reductions (CERs) generated by CDM projects. In 2011 it accounted for 87% or 79 million tonnes of CO₂e of all pre-2013 CERs traded in primary markets. However, post-2012 market China accounted for 43% or 73 million tonnes of CO₂e during 2011 (The World Bank, 2012a).

The Panda standard was launched at COP 15 in Denmark in 2009. It is the first voluntary standard designed particularly for China. Information on the projects and participation in the programme is still limited. The first reforestation methodology for public review was submitted in late 2011, as was the first reported transaction (Panda standard, 2012).

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