

Policy Brief: REDD Policy Scenarios and Carbon Markets

Introduction

Currently, credits from reducing emissions from deforestation and degradation (REDD) are eligible only in voluntary carbon markets and not under the CDM (which only allows forestry credits from afforestation and reforestation). There has, however, been renewed interest in the potential of REDD to contribute to climate change mitigation, and REDD may be included in a post-2012 climate agreement. This brief offers a brief background on carbon markets, outlines potential policy scenarios for a future REDD regime, provides REDD market estimates, describes factors affecting delivery of REDD credits, and provides key policy conclusions.

Background: Carbon Markets

Carbon markets operate in a similar way to those for any other traded commodity, the main differences being the extremely important role that public regulation has played in creating the markets and in driving demand for carbon credits (particularly since the Kyoto Protocol came into force in 2005), and the technical procedures needed to define the traded product (measured in tons of CO₂-equivalent) and to measure and track carbon emission reductions.

There are two main types of carbon markets:

- The *regulatory* Kyoto markets consist of three different flexible trading mechanisms under the Kyoto Protocol. These mechanisms include Emissions Trading between Annex-1 governments, Joint Implementation of projects in Annex-1 countries, and the Clean Development Mechanism (CDM). The CDM, through which Annex-1 countries can buy credits from projects that reduce emissions in non-Annex 1 (developing) countries, can generate carbon finance for developing countries, and was estimated at US\$5.3 billion in 2006. Demand in the regulatory markets is driven primarily by internationally mandated emission reduction targets.
- The smaller *voluntary* carbon markets generally use project-based crediting mechanisms similar the CDM, but operate outside international agreements. Companies, individuals, and other organisations without mandatory emissions targets, driven by concerns about corporate social responsibility and climate change, can offset some or all of their emissions in these markets. Voluntary carbon markets were estimated at US\$92 million in 2006, and are expected to double in size during 2007.

Projects that can generate carbon credits include emissions reduction projects (e.g. renewable energy or energy efficiency) and carbon sequestration projects (e.g. reforestation). A key difference between regulatory and voluntary markets in terms of forestry is that only afforestation and reforestation projects are currently eligible under the CDM, whereas voluntary markets allow for many types of forestry activities – including avoided deforestation. In fact, forest conservation projects have been traded on voluntary markets since the early 1990s. Considering that deforestation and forest degradation account for approximately 20% of global GHG emissions, there is significant potential for emission reductions in this sector, especially if it is included in a post-2012 UNFCCC agreement.

Architecture of a Future REDD Regime

There are several key factors that will influence the architecture of a future REDD regime:

- Whether any formal agreement on REDD can be reached at the international level;
- Whether REDD can generate tradable carbon credits or will have to rely on donor funding;
- Whether the credits in any market-based system will be fungible (exchangeable) with other credits in international regulatory carbon markets; and
- Whether national governments or activities at sub-national levels (e.g. local governments, private landholders, or project developers) will receive carbon credits or fund-based payments.

Combined, these factors result in four main policy scenarios for a future REDD regime:

Scenario 1: National crediting under a UNFCCC agreement: This scenario assumes the establishment of a baseline reference scenario and crediting for REDD on a national level. Any verifiable reduction below this baseline would result in REDD carbon credits (fungible with the larger post-2012 carbon market or traded on a separate REDD market) issued to central governments. Advantages of this approach include the potential for large financial flows, better accounting for leakage, and economies of scale. Disadvantages include the greater risk posed by poor governance, increased risk for private-sector engagement, and possible delays due to low levels of national preparedness.

Scenario 2: Project crediting under a UNFCCC agreement: In this scenario, carbon accounting and crediting would occur at the project level (which could include sub-national governmental entities), similar to the current CDM approach. Project-specific or national baselines could be applied to measure emissions reductions. Project crediting could be used in conjunction with a national-level monitoring and accounting system, though the projects themselves would become the sellers of REDD credits. Advantages of this approach include the potential for large amounts of carbon finance and a more flexible, decentralised system. Disadvantages include an increased risk of leakage, greater demands for ensuring permanence of emission reductions, and higher relative transaction costs.

Scenario 3: International fund with national-level incentive payments: The key difference in this scenario is that payments for REDD would come from a dedicated international fund rather than from carbon markets. Incentives could be calculated in a similar way, using baselines and verified reductions, and payments could be made either to central governments or sub-national entities. On the other hand, payments could also be based on measures or

commitments that are not easily quantifiable in terms of the emission reductions they may achieve (e.g. policy reforms and implementation). Advantages of this approach include fewer challenges in calculating incentives (considering that payments would not “offset” the emission reduction efforts of buyer countries) and more scope for upfront funding. Disadvantages include the likelihood of much lower financial flows and a greater risk of an inefficient allocation of payments, as well as reduced accountability and transparency.

Scenario 4: Voluntary markets only (no international REDD agreement): Credit-based incentives from voluntary markets could become the main source of REDD funding if no international agreement is reached. This option would most likely focus on crediting against project-specific baselines. Voluntary markets thus represent a fallback option, though they could also efficiently complement a future regulatory REDD market. Advantages of voluntary market funding may include a more diverse range of project types, lower transaction costs and bureaucratic hurdles to implementation, and greater emphasis on social and environmental benefits. Disadvantages include much smaller financial flows, the potential for lower standards, and less national process ownership.

There are already REDD pilot projects under development, with some relying on voluntary markets and others on donor funding. These can be valuable test cases for advancing and implementing REDD, though the integrity of a future REDD trading scheme will only be maintained if appropriate safeguards, such as registries to prevent double-counting, are put in place.

Size of Markets for Future REDD Carbon Credits

Estimating the future size of REDD markets and prices of REDD credits is extremely challenging due to a range of factors, such as future emissions trends in countries with reduction targets, the stringency of future Annex-1 targets, the possible inclusion of additional sectors (e.g. shipping and aviation) and countries (e.g. the USA) in future international agreements, and the performance of “competing” mechanisms – particularly the CDM – in generating credit supply.

Whether REDD carbon markets are created at all and whether their credits are capped or fully fungible with other markets depends entirely on the outcome of international negotiations. Furthermore, the number of credits created depends on the costs and difficulties of actually lowering deforestation and degradation trends, as well as on the rules and modalities for REDD (e.g. which land-use sectors, carbon pools, and forest types are eligible), among other things. It is also important to remember the larger context of a post-2012 climate agreement and post-2012 carbon markets of which REDD will be a part.

The potential *supply* of REDD credits can be roughly estimated using the average deforestation rates reported for all countries with a net forest area loss between 1990 and 2005 (a possible reference period for historical REDD baselines), the country-specific average forest carbon densities, and by assuming a range of possible reductions in deforestation rates through the implementation of REDD. The resulting emission reductions can then be multiplied by a range of potential carbon prices (see Table 1, below) to obtain market volumes. However, such estimates only capture the supply side of REDD, which will need to be met by an equally strong demand for credits.

Reduction in deforestation rates compared to 1990-2005 baseline	Amount of emission reductions	Monetary value @ US\$ 5 / tCO ₂ e	Monetary value @ US\$ 10 / tCO ₂ e	Monetary value @ US\$ 15 / tCO ₂ e	Monetary value @ US\$ 20 / tCO ₂ e	Monetary value @ US\$ 30 / tCO ₂ e
Percent	Million tCO ₂ e per year	Million US\$ per year	Million US\$ per year	Million US\$ per year	Million US\$ per year	Million USD per year
5%	153	765	1,530	2,295	3,059	4,589
10%	306	1,530	3,059	4,589	6,119	9,178
20%	612	3,059	6,119	9,178	12,237	18,356
30%	918	4,589	9,178	13,767	18,356	27,534
40%	1,224	6,119	12,237	18,356	24,475	36,712
50%	1,530	7,648	15,297	22,945	30,594	45,891

Table 1 – Supply-side scenarios of future REDD markets (Calculations based on deforestation trends reported in FAO 2006 and carbon values reported in IPCC 2003).

What Will Buyers of REDD Credits be Looking for?

Buyers of carbon credits and project developers routinely purchase on a forward basis the credits that a particular project is expected to generate. This approach has financial advantages for both sellers and buyers, and is an effective way to deal with the uncertainty surrounding future carbon prices. However, buying future credits makes it imperative that buyers and investors carry out a sound risk assessment of projects. This assessment, in addition to standard commercial considerations, will likely be similar for REDD credits. Key factors are:

- Risks regarding project implementation and performance (credit delivery),
- Quality of credits with respect to carbon standards and co-benefits,
- Volumes of credits and delivery time-frame, and
- Price of credits.

Forestry carbon projects can be risky investments because of the frequently complex social and economic drivers of land-use and land-use conversion in a given area, which can make project implementation challenging. In addition, carbon stocks may be threatened by natural causes (e.g. fires), as well as human activities (e.g. illegal logging). Broader governance factors, including the clarity and security of tenure and use rights as well as transparent judicial processes, can become very important in determining the risk profiles of forestry projects in specific countries. Buyers will generally be most interested in low-risk projects that are characterised by existing transparent financial due-diligence reporting, secure tenure, and generally good governance and predictable investment frameworks in host countries. Risks can also be managed to some extent through contractual liability arrangements. The more liability and risk taken on by a seller – for example, delivering a certain *volume* of a certain *type* of credits by a certain *time* at a certain *price* – the more attractive the credits become for a buyer, and the higher attainable prices will be.

The risk of non-permanence of emission reductions is easiest to manage in national REDD schemes or projects covering large areas and carbon volumes. REDD is fundamentally different from reforestation in that it reduces a source of emissions rather than creating a carbon sink. Permanent climate benefits are created as long as average emissions on a

national level are reduced – even if deforestation rates were to increase to pre-REDD levels in the future. To cover the potential risk of a “rebound” in deforestation rates above baseline levels, a certain proportion of credits could be retained in a buffer to act as an insurance. The relative size of such buffers would need to reflect the specific risk associated with a particular country or project and would generally be larger for projects with smaller carbon volumes. In addition, the shorter the crediting period (i.e., the project lifetime), the greater the non-permanence risk that needs to be managed. Again, good governance, transparency, and reliable law enforcement will positively affect a project’s and a host country’s risk profile, which in turn will lower the requirements for insurances (e.g. payments to a credit buffer).

Leakage of carbon benefits (emission increases outside of a project boundary due to project activities) is another risk for REDD that will be considered by carbon buyers. A key advantage of national-level REDD schemes is that intra-national leakage can be effectively accounted for, because any emission increases in non-project areas would be reflected in the same accounting system. Nevertheless, in order to ensure that actual emission reductions through REDD can be achieved and in order to reduce risks of international leakage, measures to tackle leakage are essential. Similarly, domestic incentive allocation mechanisms need to attribute net emission reductions to certain projects or administrative areas, and this would need to account for sub-national leakage – for example, by discounting attainable REDD credits in proportion to the estimated leakage caused by underlying activities. International leakage can be most effectively prevented by ensuring participation in REDD from as many countries as possible. Both leakage and non-permanence risks can be effectively addressed by tackling the underlying drivers for deforestation.

In general, the environmental integrity and quality of REDD credits can be ensured through:

- The use of rigorous and standardised methodologies for measuring and monitoring emission reductions (including accounting for leakage and any non-permanence risks), coupled with independent verification by a third party; and
- Demonstrating the additionality of emission reductions, which ensures that carbon credits are not issued for activities that would have occurred under business-as-usual conditions.

Attainable prices for REDD credits could be increased by:

- Providing low-risk credits (including a type of delivery guarantee) with low transaction costs;
- Ensuring social and environmental co-benefits such as enhanced livelihoods for local communities or the preservation of valuable biodiversity. Despite the fact that REDD projects are perceived as carrying substantial risks, voluntary market buyers are willing to pay higher prices for projects with such co-benefits; and by
- Selling credits at advanced stages in the regulatory carbon cycle (e.g. after the validation of a project design document) and in project implementation – ideally, already-issued credits for verified emission reductions.

Financial Implications for Sellers of REDD Credits

Future sellers of REDD credits – be they national or local governments, or private landholders and project developers – need to consider a range of aspects affecting the financial

performance of underlying emission reduction activities. Experiences from existing CDM and voluntary markets suggest that transaction and implementation costs, carbon and non-carbon revenues, and credit payment schedules are likely to play an important role.

Transaction costs for carbon projects can be high, and are frequently between US\$80,000-130,000 for project preparation under the CDM and other high-quality voluntary standards. Relative transaction costs for REDD (on a per-ton or per-hectare basis) might be lower if remote sensing data for baseline establishment and monitoring is already available nationally. Transaction costs for REDD are likely to include the costs of quantifying existing carbon stocks, measuring and monitoring changes in carbon stocks (including the monitoring of leakage), external verification of monitoring results, and the preparation of project documentation and its external validation and potential registration fees. In some cases, the development of project-specific baseline or monitoring methodologies may be necessary. Agreements with credit buyers to cover some or all transaction costs in exchange for a carbon price discount can significantly lower upfront and ongoing costs from the seller's perspective.

Implementation costs for REDD are likely to be highly variable and context-specific. Cost factors for underlying activities may include the enforcement of forestry and land-use regulations, improved forest management, intensified agricultural production, enhanced land-use and infrastructure planning, and local and national capacity building.

Carbon revenues generally constitute a small part of total revenues for most CDM project types. This means that most CDM projects have to generate substantial additional finance – through the sale of renewable energy, for example. Since REDD projects cannot usually be expected to produce such by-products, carbon sales will need to cover most of the implementation and transaction costs. In some cases, additional income may be generated from sustainable timber production from the project area or from efficiency gains in agricultural production through improved planning.

The *payment schedule* for REDD credits will also be of importance, especially considering the high discount rates generally applied to investments in key REDD host countries. Sellers may consider a forward sale of credits that includes upfront payments, but such arrangements would entail a lower carbon price due to greater delivery risks. In many cases, buyers may not be willing to cover upfront costs, and project developers or governments would then need to find alternative sources of finance. The intervals between the achievement of emission reductions, their verification, and the issuance of credits are also important factors, especially considering that annual verification may be prohibitively expensive for REDD, or even not eligible from a methodological point of view because of high inter-annual variations in emissions.

Legal Aspects of Carbon Credit Transactions and Risks for Sellers

Carbon contracts, or Emission Reduction Purchase Agreements (ERPAs), are an essential aspect of future REDD transactions given the need to manage risks and distribute transaction and implementation costs between buyers and sellers. If governments are the sellers of REDD credits, or if they provide price or delivery guarantees project-based sales of REDD credits,

they may be able to negotiate higher carbon prices. From the seller's perspective, four aspects of ERPAs are particularly important:

- *Volume and delivery time-frame*: Given the uncertainties in project performance and credit generation, sellers will aim for flexibility regarding delivery volume and time-frames.
- *Payment schedule*: Ideally, a proportion of payments should be made upfront.
- *Price setting*: The contract could establish a fixed price for carbon credits, though there is a risk that sellers lose out if the market price rises over time. Sellers might thus opt for an indexed price option, thereby assuming greater price risks themselves.
- *Liabilities*: Sellers need to ensure that they can deliver credits in the specified volumes and timeframe, and that they can meet liability requirements (e.g. payment of damages or replacement of credits) in case of project or delivery failure.

Key Policy Conclusions

- There is still uncertainty about the form of a future REDD regime, which will depend on an international agreement being reached in the context of post-2012 climate negotiations.
- Approaches to REDD using national carbon accounting and crediting are likely to generate the largest financial flows and entail the lowest risk of carbon leakage. However, they are more dependent on good governance in host countries, and low levels of preparedness could pose a risk to the prompt start of REDD activities.
- A carefully designed mix of national and sub-national, market- and fund-based, and regulatory and voluntary approaches to REDD could create most incentives and efficiencies. It could also maximise opportunities for learning, capacity-building, and effective pilot activities before 2012.
- Early voluntary projects and pilot activities should be encouraged. However, safeguards, such as registries to prevent double-counting, need to be put in place, and formalized schemes and potential national-level approaches should not punish early movers.
- Future REDD markets could reach a volume of several billion US\$ annually, but actual market size will depend on wide range of factors that affect a post-2012 climate regime. The performance-based nature of carbon credits means that sellers will have to meet the requirements of carbon markets in order to access financial resources.
- Risk and liability, credit quality, and price are key factors driving purchase decisions of carbon credit buyers. REDD involves high risks, especially regarding project implementation and governance. Demonstrating good governance in the land-use sector and establishing transparent monitoring and verification systems for REDD could significantly reduce these risks.

Transaction and implementation costs for REDD are likely to be significant, whereas the revenues from carbon sales may not cover the full costs and will likely occur only after emission reductions have been verified. Options for upfront finance to cover this time lag, as well as ways to increase the efficiency of national REDD approaches and generate additional income, need to be explored.

- Sellers, including national governments, will need to ensure that they can meet contractual liabilities if they fail to deliver emissions reductions. This might include paying damages to buyers or replacing credits through the open market. On the other hand, sellers should carefully negotiate the sharing of transaction costs and carbon price risks between sellers and buyers of credits.

About EcoSecurities

EcoSecurities is one of the world's leaders in the business of originating, developing, and trading carbon credits, and has experience with projects in the renewable energy, agriculture and urban waste management, industrial efficiency, and forestry. With a network of offices and representatives in over 20 countries on five continents, EcoSecurities has amassed one of the industry's largest and most diversified portfolios of carbon projects. EcoSecurities boasts a Global Consulting Services team that has assisted Fortune 500 companies with carbon market strategy and supply chain analysis, in addition to writing UN-approved emission reduction methodologies and providing policy advice. Today, the company is working on 402 projects in 36 countries using 18 different technologies, with the potential to generate more than 142 million carbon credits. EcoSecurities Group plc is listed on the London Stock Exchange AIM (ticker ECO.L). Additional information is available at www.ecosecurities.com.