

The Economics of 2°C and REDD in Carbon Markets

Greenpeace summary of KEA3 report: *“REDD and the effort to limit global warming to 2°C: Implications for including REDD credits in the international carbon market”*

30 March 2009

Background

To avoid catastrophic climate change, global temperature rise must be kept as far below 2°C as possible.¹ To achieve this goal, a strong and stable carbon price is needed to drive necessary investments in clean and renewable technologies worldwide.²

Climate change discussions have increasingly focused on the need to reduce emissions from deforestation and forest degradation in developing countries (REDD), which account for about 20% of global greenhouse gas emissions. While there is ongoing debate on the best means of financing REDD, three primary options have been proposed:

- market-offset approaches (where fungible credits from REDD are included in the carbon markets and used by industrialised countries to offset their emissions);
- market-linked and “hybrid” approaches (e.g. auctioning of carbon permits; Greenpeace Forests for Climate (TDERM) proposal; CCAP Dual Markets approach); and
- non-market approaches (such as levies, taxes, and fees)

Purpose of Research

Questions have been raised about the extent to which including REDD credits in the carbon markets would reduce incentives to invest in clean and renewable technologies and affect our ability to stay well below 2°C. Greenpeace therefore commissioned the economic modelling experts at KEA 3 to examine the impacts of including REDD in the carbon markets.

Key Report Findings

- Including forest offset credits in the carbon markets would crash the price of carbon up to 75% under currently stated reduction targets³ and 70% for the reduction target most consistent with the 2°C goal (40%).⁴ If a lower potential supply of REDD credits is assumed, the price of carbon would still fall by 60%.⁵
- Under either scenario, REDD credits would significantly reduce investments in clean and renewable technologies in *both* developed and developing countries.⁶ In delaying such investments, REDD credits could cause a “lock in” effect, keeping high-carbon technologies and infrastructures in place for many years to come. The sunken costs associated with carbon-intensive economies could increase the overall costs of mitigation.⁷
- Including REDD credits in the carbon markets would reduce investments in clean technologies in developing countries, such as China, India, and Brazil, as there would be less demand for credits generated by emission reduction policies in energy and industry sectors.⁸ For example, China alone would lose an estimated \$10-100 billion per year in clean energy and technology investments.
- By integrating forest credits in carbon markets, developed countries could significantly overpay for reducing emissions from deforestation, due to the difference between the costs of REDD to developing countries and the international price of carbon. This could come at the expense of additional mitigation opportunities in developing countries.

Greenpeace Conclusions

- World leaders must find a way to provide significant and reliable financing for REDD which is additional to deep emission reductions in industrialised countries and ambitious renewable energy and energy efficiency investments in developing countries. Among available financing options, the direct inclusion of forest offset credits in the carbon markets carries the greatest risks to both the climate and the forests. REDD credits could depress and cause major fluctuations to the price of carbon thereby preventing the investments in clean and renewable technologies needed to keep global temperature rise well below 2°C.
- Including REDD credits in carbon markets would cause countries – both north and south – to “lock in” dirty technologies, such as coal-fired power stations, in the next decade. Such a scenario could significantly increase the overall costs of long term mitigation and impede the ability to stay well below 2°C. To prevent such unintended consequences, governments must focus on providing a strong and stable price of carbon as well as providing strong overall reduction targets.
- While certain developing countries with tropical forests could initially benefit financially from selling REDD offset credits, the resulting delay in stopping global emissions would mean their forests could ultimately be destroyed due to the impacts of failed mitigation of climate change, which is likely to increase as a result of REDD offset credits. According to recent modelling by the Met Office Hadley Centre (UK), the probability of irreversible loss of much of the Amazon forest increases dramatically above a 2°C rise in temperature.⁹
- The report shows the negative impacts of REDD credits while assuming they are of comparable quality to energy credits. However, significant questions of permanence, leakage, and additionality have been raised about potential REDD credits; as well as the ability of countries to accurately measure, monitor, and report on such emissions. Issues of quality need to be addressed for any REDD mechanism to succeed, but cause significant problems when REDD is used to offset industrialised country emissions.

Greenpeace Recommendations

- Carbon markets must provide a strong and stable price of carbon to drive the development of clean and renewable technologies and should therefore remain focused on the more easily quantifiable and comparable fossil fuel emissions. A separate mechanism is needed to deal with the complexities and risks associated with REDD.
- A successful REDD mechanism **cannot be based on the inclusion of REDD offset credits in the carbon markets** but should rather have the following characteristics:
 - Contain the goal of **ending gross deforestation** and associated emissions in all countries by 2020, and achieve zero deforestation in priority areas (such as the Amazon, the Congo Basin, and in Indonesia and the Archipelagos) by 2015.
 - Require **national-level reductions** in forest emissions in order to avoid the problem of leakage (i.e. deforestation shifting from one area to another), which would inevitably result from project-based (i.e. “sub-national”) approaches.
 - allow for the **broad participation of countries** with tropical forests
 - **benefit biodiversity** protection consistent with international conventions and objectives to avoid perverse incentives and outcomes
 - **fully respect the rights of indigenous peoples and local communities** and provide a forum where their issues may be raised
 - ensure that **benefits are equitably shared** among and within countries
 - provide for **independent monitoring and verification** of activities and results.
- Greenpeace has put forward its own proposal for a hybrid market-linked fund mechanism that would meet these requirements, avoid the problems associated with market-offset mechanisms for REDD, and become part of the next phase of the Kyoto Protocol. To learn more about the Greenpeace Forests for Climate (TDERM) approach, please visit www.greenpeace.org/forestsforclimate

About the authors

The KEA 3 principals involved with the report "**REDD and the effort to limit global warming to 2°C: Implications for including REDD credits in the international carbon market (30 March 2009)**" had previously collaborated with the Centre for European Economic Research (ZEW) on a REDD analysis for the New Zealand government. The report has been peer reviewed by Dr. Jayant Sathaye, an internationally-recognised authority on climate change, forestry and energy issues, leader of the International Energy Studies Group at the Lawrence Berkeley National Laboratories (Berkeley, California) and a lead author for the Intergovernmental Panel on Climate Change (IPCC) since 1990.

Report Methodology

KEA 3 utilised a numerical partial equilibrium model of the global carbon market in the year 2020, including energy-intensive and non-energy intensive sectors for both Annex I and CDM regions, to quantify the impacts of including REDD offset credits in the carbon market. The model focused on reductions in the 25-40% range identified by the IPCC as being necessary for keeping global temperature rise to 2.0-2.4°C. A broad number of scenarios for incorporating REDD credits into the carbon markets were modelled (unlimited REDD, 50% and 20% limitations on REDD). A sensitivity analysis was then conducted where the potential supply of REDD credits was both doubled and halved to provide for a more comprehensive analysis of impacts.

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- ¹ See Intergovernmental Panel on Climate Change (IPCC) Climate Change 2007: Impacts, Adaptation, and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the IPCC; Hansen, J., 2008: Tipping point: Perspective of a climatologist, *State of the Wild 2008-2009: A Global Portrait of Wildlife, Wildlands, and Oceans*. W. Woods, Ed. Wildlife Conservation Society/Island Press, at 6-15.
 - ² "An effective carbon-price signal could realise significant mitigation potential in all sectors." "The higher the market prices of fossil fuels, the more low-carbon alternatives will be competitive, although price volatility will be a disincentive for investors." Intergovernmental Panel on Climate Change 4th Assessment Report, WGIII, Summary for Policymakers, at 19, 13 (2007). "Providing a strong, stable carbon price is the single policy action that is likely to have the biggest effect in improving economic efficiency and tackling the climate crisis." Joseph Stiglitz and Lord Nicholas Stern, Obama's chance to lead the green recovery, Financial Times, 2 March 2009.
 - ³ An overall reduction target based on currently stated public commitments by individual countries and their leaders which relates to a 34% increase in greenhouse gas emissions over 1990 levels.
 - ⁴ KEA 3 results based on an estimated baseline deforestation rate of 5.798 GtCo₂-eq, largely consistent with the baseline rates of deforestation only (not including degradation) of 5.8-7.2 GtCo₂-eq found in the following sources: UNFCCC Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate international response to climate change, at 18 (2007); IPCC Fourth Assessment Report, Working Group III, Chapter 9: Forestry (2007); Stern Review, the Economics of Climate Change, part III, at 176 (2006); Carbon Sunk: The Potential impacts of Avoided Deforestation Credits on Emissions Trading Schemes, Paul Leach, Rainforest Foundation (2008) (based on FAO figures).
 - ⁵ The base model used by KEA 3 assumed a baseline deforestation rate of 4.5 GtCo₂-eq per year, less than the sources above, but more than that contained in certain other studies. The estimation of baseline deforestation rates and the potential supply of REDD credits can vary in such studies and yield significant changes in modeling results.
 - ⁶ Most studies on REDD to date have focused exclusively on impacts on investments in industrialised countries.
 - ⁷ "Sunken costs" are costs that cannot be recovered once they have been incurred. For instance, the KEA 3 report points out that once a coal fired power plant has been built, it will likely be allowed to continue to operate for an extended period of time despite large increases in the price of carbon.
 - ⁸ KEA 3's model is based on existing available data and therefore assumes the CDM remains the same as it is right now. However, Greenpeace believes that from 2013 onwards, the Clean Development Mechanism (CDM) as a project-based mechanism should be limited to least developed countries and other developing countries with little capacity to act. For other, more able developing countries, the post-2012 deal needs to provide new crediting mechanisms, such as sectoral and national no-lose targets, which incentivise long-term low-carbon development planning on a sectoral and economy-wide level, deliver additional emissions reductions and reduce transaction costs.
 - ⁹ Jones, C., Lowe, J., Liddicoat, S & Betts, R. 2009. Committed ecosystem change due to climate change. IOP Conference Series: Earth and Environmental Science 6: 062017 doi:10.1088/1755-1307/6/6/062017 Climate Change: Global Risks, Challenges and Decisions, Copenhagen 10-12th March 2009.