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Forging a Path for High-Quality Compliance REDD Credits

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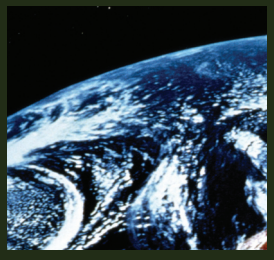



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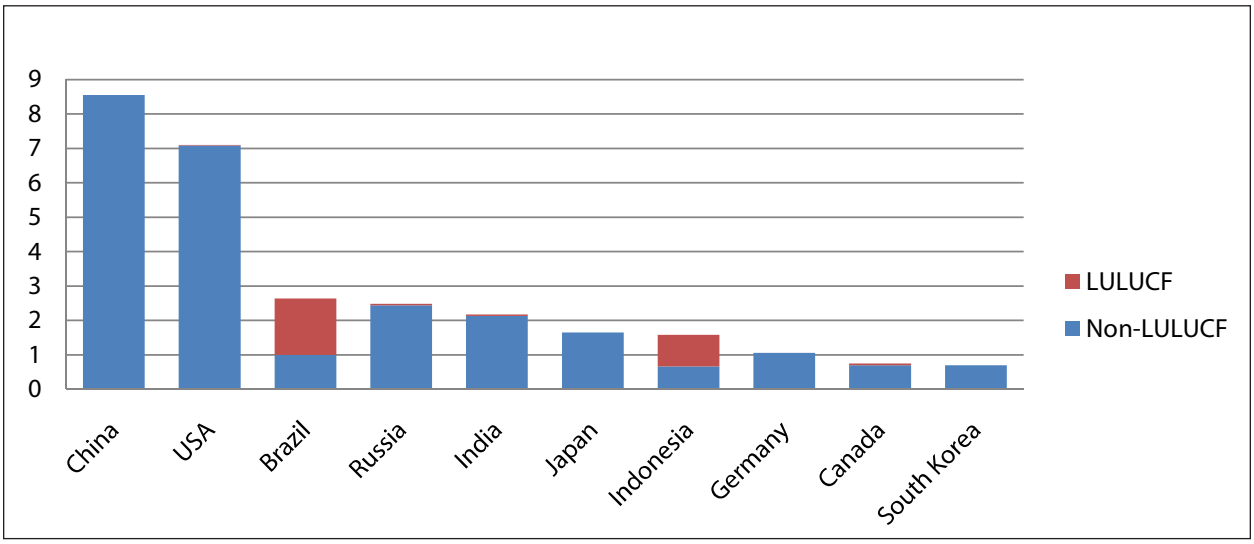
1. Introduction

Concerns over the potential for catastrophic climate change drive the call for significant reductions—50%–80% by mid-century—in the concentration of greenhouse gases (GHGs) in the atmosphere. With 15%–20% of current GHG emissions resulting from forest clearing,[1] it would be nearly impossible to meet these long-term goals without addressing the forest problem, and would be more costly to hit any target regardless.[2] Most of the forest GHG emissions globally come from the clearing and degradation of forests in the tropics.[3] As a result, some countries that would normally be considered developing or emerging economies are among the world's largest GHG emitters (Figure 1). These tropical forest developing countries may not have the resources to address the problem entirely themselves. As a result, most policy initiatives to address forest's role in climate change mitigation involve developed countries financing much or most of the reductions, at least initially. This could involve financial transfers from developed countries to developing countries for reduced emissions from deforestation and degradation (or REDD) and possibly additional activities that (maintain or) enhance (forest) carbon stocks.

Figure 1. Land use, land-use change, and forestry (LULUCF) emissions as a portion of total emissions for top 10 emitters in 2005.



Source: Emissions Data Base for Global Atmospheric Research (EDGAR) v4.0 greenhouse gas emissions dataset (1970–2005), Joint Research Centre, European Commission. http://edgar.jrc.ec.europa.eu.

There is an emerging view that any program to address global forest emissions, and the financing to go with it, must occur in phases. A March 2009 report by the Government of Norway identifies three basic phases for a global REDD program (Table 1).[4] These phases are the pathway to a fully functioning program where developed countries provide financing to developing forest nations in return for demonstrated reductions in forest emissions. The phases will be described more fully below.

1 Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2007: Synthesis Report; Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge, UK: Cambridge University Press, 2007).

2 Murray, B.C., R. Lubowski, and B. Sohngen, "Including Reduced Emissions from International Forest Carbon in Climate Policy: Understanding the Economics," Report NI R 09-03 (Durham, NC: Nicholas Institute for Environmental Policy Solutions, Duke University, June 2009), http://www.nicholas.duke.edu/institute/carbon.economy.06.09.pdf.

3 United Nations Food and Agricultural Organization, "Global Forest Resources Assessment 2005: Progress Towards Sustainable Forest Management," FAO Forestry Paper 147 (Rome: Food and Agriculture Organization of the United Nations, 2006).

4 Zarin, D., A. Angelsen, S. Brown, C. Loisel, L. Peskett, and C. Streck, "Reducing Emissions from Deforestation and Forest Degradation (REDD): An Options Assessment Report," report prepared for Government of Norway (Meridian Institute: March 2009). This report was subsequently updated to account for an expanded view of REDD that includes carbon stock as well as reduced deforestation and degradation (REDD+). The report uses slightly different nomenclature for the phases, but they are essentially as described here. That report is C. Streck, L. Gomez-Echeverri, P. Gutman, C. Loisel, and J. Werksman, "REDD+ Institutional Options Assessment," report prepared for Government of Norway (Meridian Institute: September 2009). Both reports can be found at http://www.REDD-OAR.org.

Table 1. A characterization of the phases for implementation of forest carbon policy and programs.

Phase 1 – Planning	Development of a national forest carbon strategy, including national dialogue, strengthening institutions, and demonstration activities mostly funded through voluntary contributions through such mechanisms as the World Bank's Forest Carbon Partnership Fund (FCPF),[5] UN REDD,[6] and other bilateral arrangements.
Phase 2 – Implementation	Implementing policies and measures proposed in the national strategies using sustained funding from a global facility supported by binding financial commitments from developed countries. Those developed country commitments may be tied to a national cap-and-trade policy and financed by revenues generated therein. Developing country use of these funds would be based on demonstrated commitment and continued performance assessed using indicators of emission reductions.
Phase 3 – Payment for Reduction	Paying for performance on the basis of forest emission reductions relative to an agreed-upon national reference level. Financing can be through global compliance markets tied to national cap-and-trade policies or other compliance-linked mechanisms.

Table from Olander et al. 2009[7]

The third phase pays for the actual verifiable reductions that occur. The emerging expectation at this stage is that payment will be for actual results, rather than actions. Where the financing comes from at this stage is still very much in policy negotiation. Three basic options include:

1. ***Market.*** Used by emission-capped countries as part of an offset system to meet the cap requirement (within a UN-sanctioned agreement such as the Kyoto Protocol). This is sometimes referred to as for compliance purposes.

2. ***Fund.*** Official development assistance (ODA), or a separate and additional tranche of resources not tied to any compliance obligations.

3. ***Compliance-tied fund.*** A "fund" that comes from the sale of GHG allowances tied to a compliance target.

Many believe that using forest carbon offsets in the compliance market in capped countries could provide the largest source of funds to pay for actual reductions. A recent study estimated that compliance demand for international forest carbon in the U.S. alone could generate payments of more than $30–$50 billion per year in 2020 to meet compliance targets similar to those contained in currently pending U.S. legislation (the Waxman-Markey Bill, H.R. 2454), depending on the scale and scope of the program and whether offset use is restricted.[8] But other parties have concerns that any type of offset system diverts abatement efforts from core emitting sectors (energy and transportation) and should therefore be limited. These concerns seem to be accentuated with REDD, perhaps because it shifts reductions from developed countries to developing countries (though with compensation) and because of broader concerns about whether REDD reductions can be verified. These concerns are reflected in the reluctance of major potential compliance markets, such as the EU, to commit to compliance use of REDD offsets, although an EU declaration has stated that under certain conditions it will consider compliance crediting for forest carbon in the next phase of the global climate agreement.[9]

The third financing category is a version of the second approach that uses auction revenues from emission allowance auctions or direct allocation from a compliance market to finance the fund. In other words, it uses a

5 http://www.REDD-OAR.org.

6 http://www.undp.org/mdtf/UN-REDD/overview.shtml.

7 Olander, L.P., W. Boyd, K. Lawlor, E. Myers Madeira, and J.O. Niles, "International Forest Carbon and the Climate Change Challenge: Issues and Options," Report NI R 09-04 (Durham, NC: Nicholas Institute for Environmental Policy Solutions, Duke University, June 2009), http://www.nicholas.duke.edu/institute/carbon.issues.06.09.pdf.

8 Murray et al., "Including Reduced Emissions" (see n. 2).

9 Within three months of the EC's signature on an international agreement on climate change that requires a 20% reduction on GHG emissions by 2020, the Commission is directed to report, and as appropriate, propose amendments to the Directive that would permit, *inter alia*, the use of REDD and other credits from countries that have ratified the agreement. See specifically Article 28, Sections 1(g), 2 and 3 of the Directive 2009/29 EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the community, in 5.6.2009 EN official Journal of the European Union L140/63.

compliance market as a source of the financing, but not to offset domestic compliance obligations. Rather, allowance revenues from a cap-and-trade program or the direct allocation of allowance value can generate funds to be used for REDD payments without changing the dynamics of compliance obligation. One could imagine numerous other ways to finance such a fund.

One potential driver of REDD activity is for tropical forest countries to take this on as part of their "common but differentiated responsibilities" under the United Nations Framework Convention on Climate Change (UNFCCC). This has emerged in the current negotiations under the category *nationally appropriate mitigation actions* or NAMAs. Financing of NAMAs—whether REDD or other activity and whether funded entirely by developed countries or at least partly by some developing countries as a first step in their long-term commitment—is still an open negotiating point.

As of this writing, the international community has not come to consensus on the funding of Phase 3 reductions. As indicated above, under the UNFCCC, the EU bloc has indicated a willingness to consider REDD for compliance purposes in the next phase of the international agreement. The pending legislation in U.S., the Waxman-Markey bill, uses a mix of Approaches 1 and 3, with REDD allowed both as part of the international offset program (Approach 1) and with 5% of allowances allocated for REDD (Approach 3), to be phased out over time. The latter approach is intended to generate "supplemental" emission reductions from REDD that go beyond the reductions from the capped sectors, although the legislation also calls for these funds to be used for capacity building. The REDD seller countries are mixed on the funding issue, with the Coalition for Rainforest Nations, a bloc of about 40 tropical countries, favoring a compliance market-based funding approach, and Brazil, a large source of current emissions and REDD potential, favoring a fund-based approach.[10]

1.1. Focus of this paper

This paper focuses on defining and achieving "compliance-grade" quality in REDD, regardless of the financing source. Whatever the mix of funding, public or private, there is a need for payments for REDD to be matched by assured reductions. While any expenditure should be paired with assurances that the buyer is getting what they pay for, the need for assurance in compliance markets is particularly acute because of the direct fungibility with other abatement efforts. **Thus, this paper focuses significantly on attaining quality for compliance markets.**

"Quality" can be viewed as the level of assurance that emissions reductions are real, effective, and sustainable (see below).

The paper addresses three key sets of questions:

1. ***What is compliance-grade forest carbon?*** How can it be developed with an eye towards appropriately high quality? (Section 2)

2. ***How do we get there?*** What should be the pathway for forest carbon to reach the status of high-quality compliance carbon post-2012? (Section 3)

3. ***How do we maintain quality?*** What institutions and capacity is required to ensure credibility and provide for contingent corrections? (Section 4)

The primary audience for the paper includes those policymakers engaged either at the international level (the UNFCCC process) or those developing major national initiatives (U.S. climate legislation), who are considering the appropriate role of compliance market-based finance for REDD and how such a compliance system could be implemented post-agreement.

10 See Murray et al., "Including Reduced Emissions," for variations on U.S. compliance demand capacity for REDD.

2. Compliance, Quality Criteria, and Capacity Needs

What is compliance-grade forest carbon? How can it be developed with an eye towards ensuring sufficiently high quality?

2.1. Defining compliance and "compliance-grade"

To explain what we mean by compliance-grade, we define compliance as *for use in meeting binding GHG reduction commitments*. An example of a binding commitment is when a country or some other governing entity places a cap on GHG emissions within its jurisdiction. The cap might be part of a cap-and-trade program in which the cap is enforced by issuing a certain fixed number of allowances, which covered entities would need to obtain in an amount equal to the emissions they release during the course of the compliance period. Firms would have the flexibility to buy allowances from another capped entity or from credits generated by an uncapped entity who demonstrates that it has voluntarily reduced its emissions by an amount equal to the number of credits issued. This latter exchange is called an *offset* and it is the type of transaction envisioned for REDD if it is allowed for compliance purposes. That is because REDD is targeted at countries who, at least for now, are not expected to take on binding emission commitments themselves; thus any reductions would fall outside the cap. Box 1 provides an example.

Box 1. Use of REDD offsets for compliance purposes.

Capped country A has agreed to reduce its emissions to 2 billion tons in 2015. Even with its climate policy in place, emissions are projected to be 2.1 billion tons. Firms in Country A abate emissions through changes in technology, fuel switching, and efficiency investments, but the more they cut, the more expensive it gets. To help them meet their compliance target, firms in Country A buy offset credits generated by REDD activity in tropical Country X because they are less expensive than further reductions at home. Country X has a reference level of 400 million tons of emissions from deforestation and degradation. Through implementation of domestic policies, such as the removal of agricultural subsidies, modification of road networks, and payments to landholders to forgo logging, Country X has cut emissions to 300 million tons. This leads to the generation of 100 million tons of REDD credits, which are sold to the compliance buyers in capped Country A. Country A achieves its aggregate target less expensively; domestic emissions are higher than the cap, but deforestation is reduced to offset this surplus. Country X receives payment for reducing emissions and society receives the range of ecosystem services that forests provide.

By compliance-grade, we mean that the credits generated by the REDD system are of sufficiently high quality to meet legally binding commitments and to sustain a functioning market.[11] The standard for what qualifies as "compliance-grade" will be determined by the political processes in each country that set legal standards and create enforcement mechanisms. Some countries will have more stringent standards of compliance than others or greater capacity to enforce those standards. Because of those differences in standards and enforcements, a post-Kyoto agreement that incorporates cross-border crediting for REDD will need harmonization and some form of "quality control," while maintaining flexibility to varying and evolving conditions in REDD countries. We start by defining a set of criteria that define compliance quality.

2.2. Quality criteria

We assert that performance- or results-based crediting is needed for compliance purposes. In other words, compliance credits are issued only for emission reductions that actually occur and can be verified.[12] Toward that end, we propose criteria for a high-performing REDD compliance crediting system:

- Ability to measure, report, and verify (MRV) against a reference level
- Legality
- Efficiency
- Resilience
- Sustainability

11 There are, in any important traded commodity, notions of reliability and investor protection that, though not the subject of this article, are important issues to enable a market-based system to develop fully. For carbon markets to generate the billions of dollars required to finance global mitigation, buyers of offset credits will be not only capped emitters (compliance buyers) but also financial investors, such as hedge funds and pension funds, for example. "Quality" from the standpoint of these investors will be an important issue to define to allow reasonable expectation of value based on adequate disclosure.

12 This does not necessarily mean that contracts for advance delivery of credits cannot be established between buyers and sellers, only that the actual credits will be based on results, not process, expectations, or promises.

The following section discusses these criteria in more detail.

2.2.1. MRV against a reference level

As the name suggests, credits must be capable of being measured with reasonable accuracy, they must meet transparent reporting standards, and they must be verifiable by outside parties to ensure confidence that they represent reductions that actually occurred. Measurement refers to the ability to quantify reductions, which follows the basic equation:

emission reductions = actual emissions (or net change in sequestration) – reference level

Actual emissions (change in sequestration) reflect the physical measurement of carbon (and possibly other GHG) fluxes from the entity in question. Physical measurement captures two separate dimensions: the area of land-use change (e.g., deforestation) and the carbon released or sequestered in that area. The scope and scale of observation are critical here. Regarding scope, the issue boils down to whether we track (reductions in) deforestation (RED); deforestation and degradation (REDD); or deforestation, degradation, and carbon stock enhancement (REDD+). The broader the scope is, the broader the measurement responsibilities are. This is why the term net change in sequestration is parenthesized in the equation above. If the program will pay for reduced degradation and enhanced carbon stock (sequestration), then clearly the measurement must reflect those activities.

The other critical issue is scale. If measurement occurs at the project (site) level, one can directly measure the carbon stock changes on-site. But it is well-recognized that a project-level focus ignores leakage, a potentially important shift of emissions to other sites that are not covered in the accounting system or incentive program.[13] Concerns about leakage have led to the call for a more comprehensive scale of coverage of the accounting system, either national or regional. By broadening the accounting scale accordingly, one can net out any leakage that occurs within the zone of coverage. National accounting is being broadly advanced as the ideal scale of coverage for REDD in international and national (e.g., U.S.) deliberations, though some sort of graduation to achieve national accounting status may be required. This issue will be discussed more below.

Whatever scale of accounting, a reference level is needed to compare with the level of actual emissions (net of sequestration) level to compute the reductions. A reference level, generally speaking, is supposed to represent the level of emissions (sequestration) that would occur without the policy intervention. At the project scale, this is often referred to as the project "baseline." The term baseline is sometimes used at the national scale as well, but we will use "reference level" for the national or regional cases to avoid confusion. Baselines and reference levels are challenging to estimate because they attempt to represent a situation that will not occur and thus can never be directly measured. It is a hypothetical projection of what would happen in the future without a policy and thus is inherently uncertain. There are numerous ways that a reference level could be set[14] and guidance is still being issued for doing so on a national scale.[15]

Emission reduction estimates must also be reported in a standardized, transparent, and understandable format so that they can be reasonably entered into a crediting system. Various reporting and credit registering standards are being developed in emerging voluntary markets that can form the basis for reporting criteria for compliance purposes.[16]

13 Murray, B.C., "Leakage from an Avoided Deforestation Compensation Policy: Concepts, Empirical Evidence, and Corrective Policy Options," in *Avoided Deforestation: Prospects for Mitigating Climate Change*, ed. C. Palmer and S. Engel (Oxford, UK: Routledge, 2009).
14 Harris, N.L., S. Petrova, and S. Brown, "A Scalable Approach for Setting Avoided Deforestation Baselines," in *Avoided Deforestation: Prospects for Mitigating Climate Change*, ed. C. Palmer and S. Engel (Oxford, UK: Routledge, 2009).
15 UNFCCC Subsidiary Body on Scientific and Technological Advice (SBSTA), "Report on the expert meeting on methodological issues relating to reference emission levels and reference levels," FCCC/SBSTA/2009/2, 30th session of the SBSTA (May 14, 2009), http://unfccc.int/resource/docs/2009/sbsta/eng/02.pdf.
16 Voluntary Carbon Standard (VCS), "Guidance for Agriculture, Forestry and Other Land Use Projects," (November 18, 2008), http://www.v-c-s.org/docs/Guidance%20for%20AFOLU%20Projects.pdf.

Verification means that a designated third party can and has examined the situation and deemed that the claimed reductions have indeed occurred, subject to the measurement and reporting protocols established in the program. Independent verification is critical to ensure the integrity of the compliance program.

2.2.2. Legality

Creating a solid legal foundation for high-quality REDD credits depends on developments in several legal regimes (See Figure 2):

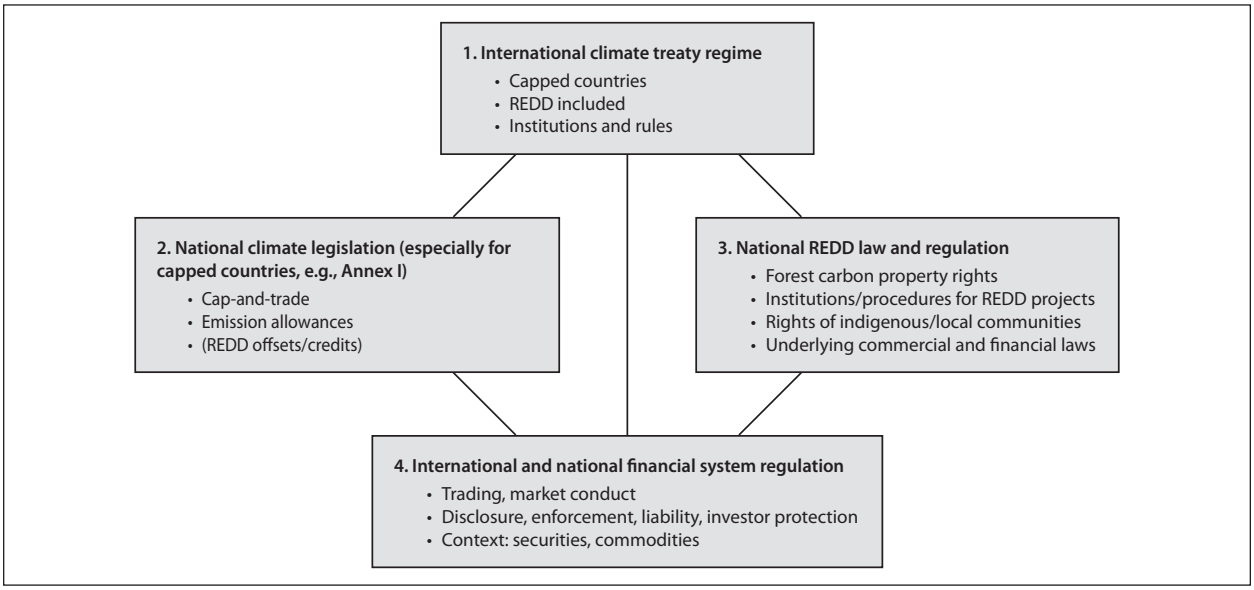
1. ***The international climate regime as captured in binding obligations among nations (not only adhering to the climate treaty, i.e.,*** UNFCCC, but also to other treaties and declarations focused on biodiversity, rights of indigenous peoples, trade, etc.);[17]

2. ***National or supranational climate legislation to regulate emissions of GHGs and to create cap-and-trade systems to implement or exceed the nation's obligations under the climate treaty;***

3. ***Laws in forest countries that clearly define the rights to forest carbon in relation to other forest and property rights, along with a legal and regulatory framework to govern the planning, approval, execution, and financing of REDD programs through public and/or private means;[18] and***

4. ***Laws, standards, and codes of practice that will govern REDD credits within national and international financial regimes for commodities, securities, and/or investments.*** This would include issues of disclosure, investor protection, market practices, enforcement, and assignment of liability.

Figure 2. Legal context for REDD.



17 Analysis of the dynamics of the new international climate treaty or the interplay between the climate treaty and other international agreements is beyond the scope of this paper. For more discussion regarding REDD and issues of rights of indigenous peoples, see D. Goldberg and T. Badua, "Do People Have Standing? Indigenous Peoples, Global Warming, and Human Rights," *Barry Law Review* 11 (Fall 2008): 59; or, regarding trade, see A. Pentsonk, "'Docking Stations': Designing a More Welcoming Architecture for a Post-2012 Framework to Combat Climate Change," *Duke Journal of Comparative and International Law* 19 (Spring 2009): 433; also see G.C. Hufbauer, S. Charnovitz, and J. Kim, "Global Warming and the World Trading System" (Washington, D.C.: Peterson Institute for International Economics, March 2009).

18 A more nuanced discussion of the legal complexity of REDD in the context of other variables, such as alternative uses of the forest lands for minerals, timber, tourism, agriculture, the rights of indigenous peoples, and environmental services, see J.L. Capella, "Contractual Arrangements for the Implementation of Forest Carbon Schemes with Emphasis on REDD Schemes in Peru: Legal and Institutional Considerations," in Final Report of the Forest Carbon Finance Summit 2009: Making Forest Carbon Markets Work, Harvard Law School Program on International Finance Systems, Washington, D.C., March 6–8, 2009, http://www.law.harvard.edu/programs/about/pifs/symposia/fcfs/09-fcfs-final-report.pdf.

Satisfying the third of those areas above, while not being the issue receiving the most discussion, may be the most immediate and unique challenge for REDD. For REDD credits to have value and be legally enforceable rights, they must be backed by the rule of law, originating from well-defined property rights that allow those who possess those rights to enjoy compensation from their use or disposition. Without this, there could be disputed claims of ownership of the forest carbon that will not only hinder the generation of REDD credits, but will also create enormous uncertainty for owners or buyers of those credits.

For example, suppose deforestation is reduced in an area that is home to an indigenous community in Country X. An organization, working with existing forest concession owners, signs an agreement to acquire the forest carbon rights in return for cash and services. That organization then sells the REDD credits to a broker, and pockets the money. Perhaps, ultimately, an investor, such as a pension fund, or a carbon fund whose shares are owned by retail investors, purchases the credits. What happens if the indigenous community disputes the legitimacy of the initial contract, or demands a share of the carbon proceeds or another financial remedy? How will this situation be resolved? Judicial processes within Country X might resolve the issue under its laws involving theft, fraud, or improper representation. Leaving such disputes to ex-post judicial resolution, however, is not optimal from the perspective of any of the parties to the example above. The possibility of such disputes would be a major source of uncertainty that would reduce the attractiveness for potential investors and financiers of REDD, many of whom reside thousands of miles away from the forest.

Thus, a critical prerequisite to large-scale REDD is for Country X to firmly establish legal and economic rights to forest carbon and transparent rules and procedures for those rights to be exercised, including the ability to buy and sell them. The legal framework for forest carbon law must fit both the unique historical and constitutional requirements of Country X and its stage of economic development, including providing for the roles of agriculture and forest products. The laws must also conform with international treaty obligations, including obligations related to biodiversity and protecting the rights of indigenous communities. Providing for such considerations is not only a matter of law, but also critical to making REDD sustainable economically. Local and indigenous communities are unlikely to support REDD strategies unless they receive economic and social benefits. Even if those benefits do not include direct or indirect rights to carbon revenue, the legal rights of forest communities to be informed and to participate in making decisions that will impact their futures will be key to the legitimacy and sustainability of those decisions.

2.2.3. Efficiency

For a compliance market to deliver cost-effective outcomes, the market must be efficient at creating and consummating transactions. In an efficient market, buyers and sellers come together easily and exchange credits transparently with low transaction costs. In an ideal setting, this allows for the determination of a market price that maximizes the total gains from trade of all parties. There would be many buyers and sellers participating in the market so that no one party can exert power over the others and extract a disproportionate share of the gains from trade. Under REDD, it may not always be possible to have large numbers of potential buyers and sellers for each transaction. Globally there may well be plenty of buyers and sellers of REDD credits, but this may winnow down to a small number for any one transaction. This would particularly be the case if the national government were to play a central role in the distribution of credits within the country and thus were possibly the only potential buyer for sellers within the country.[19] Even with a single buyer, there are mechanisms, such as certain types of auctions that can deliver efficient and fair pricing for sellers.

Transaction costs are a potentially big issue for REDD, involving costs associated with items such as certifying and verifying MRV at the transaction level, aggregation or search costs associated with bringing together buyers and sellers, establishing and enforcing contracts, and registering and transferring credits. Many of these costs

19 The role of the forest country national government in a REDD is an open issue, with some proposals calling for the national government as the central holder of credits and others involve direct transactions between external parties and subnational entities (see Angelsen, A., C. Streck, L. Peskett, J. Brown, and C. Luttrell, "What is the Rights Scale for REDD?" in *Moving Ahead with REDD: Issues, Options and Implications*, ed. A. Agelsen (Bogor, Indonesia: Center for International Forestry Research [CIFOR], 2008).

are relatively fixed in nature, thus hitting small projects harder in relative terms, and can vary substantially given the heterogeneous nature of the landscape, land tenure, level of sophistication of potential market participants, and infrastructure available for them to engage in commerce. Thus, systems that can leverage scale to reduce measurement costs, more effectively aggregate transactions, harmonize contracts, and streamline crediting and exchange can all enhance market efficiency.

2.2.4. Resilience

A resilient market can withstand shocks to supply and demand without market ruination or untenable risk to the environmental objectives. We have seen recently in other market settings how lack of resilience to extreme events can destabilize a market and create severe economic and social distress. The subprime mortgage market might be instructive. The situation started with an innovative financial mechanism (securitization of home mortgages as mortgage-backed securities) that, like REDD, supported a socially desirable purpose (generating finance for home ownership). The securitized mortgages were then extended to new financial products (collateralized mortgage obligations or CMOs) where the risk modeling for extreme events (such as a large drop in housing prices) turned out to be inadequate. Many investors, both sophisticated and unsophisticated, suffered large losses. The borrowers (homeowners) also suffered losses of value and financial disruption.

One could foresee similar risks to forest offset investors and borrowers (forest owners and communities) if there is inadequate market resilience in the case of an extreme event. In the case of REDD, extreme events might be macroeconomic shocks in the economy, or forest-specific events, such as forest fires or infestations by pests, that destroy forests over large areas and release massive amounts of carbon. A sudden and massive release of carbon that results in the country exceeding its emissions reference level, under a plausible interpretation of yet-unspecified law, would disqualify all the REDD projects in that country from receiving offset revenue, even those in parts of the country that were not affected by the fire or pestilence. The REDD market would be disrupted, local investors and workers in those projects would suffer, and the offset owners of even unrelated projects in that country would lose value. The forest community or other planned beneficiaries of offset finance, including the government, would receive no carbon revenue in that and possibly future years. Forest projects with fixed obligations (e.g., payroll, debt service) could be "foreclosed." Forest dwellers and companies that had been counting on offset revenue may have no choice but to return to logging and forest clearing, reversing the success of REDD programs. This would undermine not only projects that were damaged but also otherwise successful projects. There could be spillover effects to REDD finance for other countries if investors lost confidence. In summary, it would be a disastrous outcome for all the stakeholders—and for the forests.

The lesson for REDD is not so much that instability in the carbon market risks destabilizing the world economy as arguably the subprime mortgage crisis had the potential to do; it is unlikely to be large and leveraged enough to cause such distress. Rather, the issue here is that unmanaged country-specific risks of extreme events might destabilize the REDD market, could also undermine the broader REDD agenda and the carbon market as well. The broader market can be protected against this risk if disclosure rules and the legal framework clearly establish liability to replace "lost" carbon credits. In the case of extreme events, however, individual countries holding this liability might find it difficult to meet their obligations, risking default. At best, with the carbon revenue shut off, they might lack the funds to restore damaged projects and to maintain the undamaged projects. These short-term funding needs could be addressed by some mix of insurance, buffer pools at the national level, or possibly an international emergency facility (such as a "Carbon IMF") that could step in to avoid defaults or help affected projects and provide remediation to projects and perhaps to the broader economies of forest communities. Institutional options such as these are discussed further below.

2.2.5. Sustainability

Growth in population and the increasing demand for food, fiber, and fuel are driving deforestation. Thus, a critical question arises in evaluating the quality of any system for REDD compensation: Will the compensated REDD achievements today be sustainable for the following decades in the face of the increasing needs of a growing population? For example, suppose a REDD country develops a plan and commits resources over the

next five years to reduce emissions from deforestation and degradation by doubling the size of its protected areas, reforming agricultural policies that currently subsidize land-clearing, and developing a payment for ecosystem services (PES) program for private landholders who voluntarily agree not to clear land deemed at risk. This program could very well have a significant and immediate impact on national deforestation rates, bringing them well below reference levels and generating revenue from REDD credits.

However, while the country succeeds in slowing deforestation in the short run, it may not have adequately planned for the long run. A country whose population is growing at an annual rate of 2% will need to double its capacity for food before 2050. If it is also moving to "higher value-added" foods, such as meat and dairy products, and/or pursuing a biofuels agenda, the demand for new lands could increase three or four times. In that scenario, the country's then elected leaders may discover that the REDD commitments made by previous governments are no longer socially or politically sustainable. Pressure would rise to undo REDD commitments. That would not only potentially undermine compliance markets for REDD, but could also create severe economic liabilities for the country, potentially at a time when the country had also accepted a greenhouse gas abatement commitment under UNFCCC. It could also create obligations on Annex 1 countries (or capped emitters) that had used the REDD offsets, and who would be forced to replace those offsets—thereby "paying twice," so to speak.

The above scenario may sound pessimistic, but it is by no means far-fetched when one looks at the world's population growth and the increasing demand for food, fiber, and fuel. Compliance-grade REDD should, therefore, require that the forest country's long-term plans for REDD be based on comprehensive and realistic plans for land use and the country's capacity to meet its future needs for food, fiber, and fuel. This requires serious macroeconomic and sectoral planning for agriculture, including how to increase the productivity of agricultural lands, as well as optimizing the mix of agricultural products the country imports, exports, and produces at home. The ability and standards to create and judge the quality of such plans is itself a matter of capacity that organizations, such as the World Bank's Forest Carbon Partnership Facility and others, are dedicating substantial resources. In addition to the ex ante judgment of sustainability, the system will need to provide for periodic re-evaluation of sustainability. If, after some time, it becomes clear that a country is not following its plan or not achieving the productivity improvements to meet its food or other needs, thus putting at risk the REDD plan that was previously judged "sustainable," then that country's compliance rating would be subject to change.

Another approach may be to make REDD credits temporary, just as afforestation and reforestation credits are temporary under the Clean Development Mechanism (CDM). Temporary credits expire after a period of time and, depending on how the rules are written, would likely need to be replaced with other credits or allowances at the time of expiration. This would give REDD countries flexibility to revisit their land-use needs at the time of expiration, but this has consequences. The first consequence is that forest-clearing has been delayed rather than eliminated. This may work for the climate problem if the rest of the economy has essentially decarbonized and the atmosphere could tolerate an uptick in deforestation emissions. But the other ecosystem services of the forest would be lost. The second consequence is that temporary credits, if they properly reflect expiry and the need for replacement will be valued less than permanent credits, as the CDM experience has clearly shown. This means that flexibility for the REDD country to adjust their future plans would come at a cost.

2.3. Capacity needs

The previous section offers several criteria for the production and delivery of high-quality REDD credits for compliance purposes. Table 2 lists capacities needed to meet these criteria.

Table 2. Capacity needs for high-quality compliance-grade credits.

Criteria	Capacity needs
MRV against a reference level	Sensors/data for detecting land-use change, carbon stocks
	Ability to establish national reference levels to quantify performance results
	National accounting framework to track intranational leakage and impermanence
	Reporting entities (credit registries, government agencies)
	Validators and verifiers
Legality	Designated National Authority
	Laws defining property rights for land, rights-of-way, trees, and carbon
	Laws governing commercial transactions
	Specific laws governing the establishment and exchange of REDD credits
	Law enforcement and remedies
Efficiency	Project developers
	Market-clearing mechanisms
	Aggregators
	Credit exchanges
	Market information services (to ensure transparency)
Resilience	Risk management
	Buffer provisions
	Private insurance
	"Carbon IMF"
Sustainability	Long-term plan and governmental commitment
	Consideration of long-term economic needs for food, fiber, and energy
	Engagement of and rewards for local stakeholders
	Adequate political stability for continuity of REDD policy

REDD candidate countries, by and large, do not have many of these capacities in place. Some elements are very specific to REDD and carbon markets—e.g., the ability measure and monitor deforestation and degradation-related emissions, carbon market aggregation services—while others, such as clarified land tenure, forest carbon property rights, and legal institutions to enable new commercial transactions, are more systemic and may reflect uneven political, economic, and social characteristics across candidate countries. Either way, these capacities will take time to develop. This point is widely recognized, as various bilateral and multilateral initiatives are now under way to build REDD capacity (e.g., the World Bank's Forest Carbon Partnership Facility, the UN REDD initiative, the multination Informal Working Group on Interim REDD Finance, the Amazon Fund initiated by Norway, and proposed U.S. legislation with allowance value targeted for REDD capacity building, to name a few). These initiatives are not only attempting to define the capacity-building needs, but also the financing necessary to support them.

Because meeting these needs will take time, it is useful to think of the development of compliance-ready carbon in phases, which is the subject of the remainder of this paper.

3. Pathway to Compliance-Grade Forest Carbon

Developing programs to address global forest emissions and the financing to accomplish this will most likely occur in phases. The March 2009 report sponsored by the Government of Norway referenced above provides details on three basic phases for a global REDD program.[20] These phases are intended to be a pathway to a fully functioning program in which developed countries provide financing to developing forest nations in return for demonstrated reductions in forest emissions. It will take time for countries to move through these phases. Given the urgency to slow deforestation rapidly, there are ongoing discussions about interim steps that can move investment forward while building and not compromising on the performance and integrity of the reductions in this interim period. Further discussion of this point is found in Section 4.2.

In general, the phases move from donor-financed capacity building toward developed country policy-based or market-based financing for fully verified, nationally measured emission reductions. The following section provides an overview of this progression through the three phases with an in-depth exploration of the structure for the third and final phase in which forest programs and a carbon market could link through the creation of compliance-grade forest carbon. For the interested reader, we provide more detail on Phases 1 and 2 in the Appendix.

3.1. Phase 1

The objectives of Phase 1 are to address institutional, governance, and capacity needs of willing countries to establish sufficient confidence in a financing structure designed around payments for performance. While progress in national governance and institutions could have widespread benefits to society, REDD implementation need not be held up until perfection is achieved. Sufficient infrastructure, coupled with solid plans and policies to give funders confidence that the country has embarked on a credible effort to complete the enabling conditions for reliable REDD within a reasonable time frame, may be a more achievable goal at the outset. For example, solving long-standing conflicts over land tenure may be demanding too much if benefit-sharing contracts can be fairly negotiated regarding how forests and carbon will be handled. Phase 1 is already under way, with significant donations from Norway and active programs through the World Bank and UN agencies, but it will need to grow substantially to accomplish its objectives in all willing countries.

Differences in resource conditions, economic configuration, land ownership, laws, and other critical factors will differ across countries. There will be no one-size-fits-all strategy. Each country will need to consider its own situation, gather additional information, develop its own strategy, and modify its policies, laws, and infrastructure as needed to effect change. This process will require time, resources, and human capital, which are acquired at a cost, and thus will need to be financed.

Oversight starts immediately in Phase 1. Financing institutions, whether individual countries implementing national climate policy (e.g., the U.S.) or international bodies pursuant to the UNFCCC, will want to see results. These financing institutions may require specific outcomes in exchange for continued financing. They could track indicators of performance themselves or have a certified third party play this role. These financing and oversight institutions will also play a critical role in informing decisions on whether to move a developing country from Phase 1 to Phase 2. These early institutions could play a continuing role as the conduit for Phase 2 financing and coordinated oversight, or an advisory role informing the new buyer/financer-designed institutions (UNFCCC- or U.S.-specified institution) that will be assuming these roles in their place.

3.2. Phase 2

Phase 2 may provide an opportunity to restructure institutions and coordinate developed- and developing-nation efforts to create institutions and structures for tracking outcomes and trading compliance carbon. Disparate initial systems for REDD financing and oversight—e.g., UNFCCC, World Bank, U.S. government,

20 Zarin et al., "Reducing Emissions from Deforestation" (see n. 7).

and the EU—should converge toward agreed international standards to help maintain the quality of commitments. If multiple systems with divergent standards persist, one could see a race to the bottom if profit is maximized through use of a lower-quality standard. Thus, it is worth considering which early institutions are well suited to be the foundations of the system and which should perhaps be temporary stepping stones along the way.

The objective of Phase 2 is to finalize and test developing-country governance and institutions built in Phase 1 and to continue the development of MRV toward a results-based system with demonstrated reductions in emissions. Phase 2 will involve the implementation of the national strategy including changes in national policies and programs. This phase can allow the development of subnational pilot programs with private financing if that is desired and workable.

In Phase 2, as in Phase 1, financing institutions will want to see results. We should begin to see real reductions in deforestation during this phase. While indicators of performance might include some measures of "policy performance," i.e., successful implementation of the policy, or milestones at the outset of Phase 2, they will shift toward biophysical measurements of forest cover, which will make tracking results easier. The Amazon Fund, which uses deforested area as an indicator of success, is perhaps an early model of Phase 2. As discussed above, REDD protocols will likely require that any claims be measurable, reportable, and verifiable (MRV) and be comparable to some indicator of emissions—likely established at the national level, but that is an item for negotiation. The financing and oversight institutions will play a critical role in the decision whether to move a developing country from Phase 2 to Phase 3.

In Phase 2 the expectation is that funding could be provided primarily by developed countries through their climate policies by the auctioning of credits or some other agreed mechanism, such as fees on carbon market transactions. Since these funds may not be available until 2012 or after, some other mechanism may be needed in the interim to allow countries to move forward. This might be accomplished by expanding funding for the Forest Carbon Partnership Facility or UN REDD. Since this new funding would be tied to developed countries' mitigation objectives, it is important that REDD nations provide clear evidence of performance, which they would likely do by tracking changes in national forest cover (which is easier to measure initially and provides an indicator of forest emissions). Phase 2 also involves the evolution of international institutions as internationally sanctioned (and financed) global facilities, which may be needed to oversee these processes. Phase 2 can be a short phase for those countries that want to move aggressively to Phase 3 and outcome-based funding.

3.3. Phase 3

Phase 3 denotes entry into the long-term regime, a system with committed, stable, and predictable funding, likely from developed countries generated through set-asides or markets designed in their domestic policy. This funding is then provided to developing forest nations for measured, reported, and verified reductions in forest emissions—compliance-grade forest carbon.

If a market-based emissions trading approach rather than a nonmarket fund generated from climate policies of developed countries is used in Phase 3, a new institution may be needed in addition to the financing and oversight institutions. An international or multilateral risk management institution, for market stabilization and crisis management, may be required to help markets address potentially large-scale risks associated with natural disasters (e.g., large-scale fires or tropical storm damage) or governance shifts (e.g., wars or changes in leadership that change commitment to forest programs) that can lead to reversals of the previous emission reductions. This institutions could set and maintain international buffers or assurance programs, perform rescues, negotiate and resolve rehabilitation programs to restore national buffers, and release supplies of reserve credits to stabilize markets if "alarm triggers" are activated. Smaller-scale risks associated with natural environmental fluctuations and small-scale fires or program and project failures could perhaps be handled at the national level with buffers or assurance mechanisms managed for each country. The following section offers more detail on how this might be structured.

4. Structures and Institutions

4.1. Dual-track option for demonstrating compliance quality

Across the three phases described above we see an evolution toward compliance-grade carbon. In forest countries this involves an evolution in outcomes from capacity and institution building to implementation of national policies; tracking of forest change; and measurement, monitoring, and verification of forest emissions relative to a nationally agreed-upon baseline. We also envisage a parallel evolution in internationally sanctioned institutions or global facilities and their roles. These institutions would be involved in coordinating and overseeing financing, tracking accounts across nations, and verifying and overseeing performance across the various stages. If well designed, these institutions can facilitate, increase efficiency, create transparency, and enhance confidence in forest carbon as a mitigation instrument. They will likely also play a critical role in ensuring that the final product in Phase 3 is high-quality compliance-grade carbon if the global or developed-country rules are sufficiently clear.

Whether a forest carbon system is developed through the UNFCCC process or initiated by bilateral and multilateral process, for instance, in response to a U.S. or European program, the criteria laid out above (ability to measure, report, and verify [MRV]; legality; efficiency; resilience; and sustainability) identify characteristics that we believe are necessary to develop quality forest carbon. The following is a description of how an international REDD system of institutions might be structured with emphasis on the pieces that should be in place by Phase 3. These institutions will likely be needed to provide sufficient oversight and coordination of efforts to produce compliance-grade credits. The structure below is loosely based on existing structures built by the UNFCCC, the Clean Development Mechanism, and Joint Implementation under the Kyoto Protocol.[21] There have been some problems with these mechanisms and their current functionality from which lessons need to be learned when designing a new REDD system. But the basic idea of linked national and international institutions appears to be sound. In order to address differences across REDD countries, two institutional options may be desirable. Track 1 is for countries with greater institutional capacity that want to manage their own national accounts and reconciliation and are capable of doing so. Track 2 is for countries that need or choose to have an international body manage the accounting and reconciliation. Track 2 may be preferred by forest credit buyers concerned about in-country governance risks, but REDD nations may prefer to have more direct management over the system. The basic structure and institutions needed within forest nations—a registry, a national authority, and a national risk management mechanism—and the complementary international structures to provide oversight, coordination, and crisis management are described in Table 3 and below.

Table 3. Dual tracks for high-quality compliance-grade credits.

Component	Track 1	Track 2
Registry	Country monitors its own forest carbon projects and programs in-country and serves as a central location to register and account for the credits they generate. Allows reconciliation of projects and subnational activities in the national accounts. Cancels forest credits in the registry once they are transferred to buyers.	An international supervisory body and centralized credit registry oversees methodologies and project approval within the country (like CDM). Tracks forest carbon projects and programs in country to allow reconciliation of projects and subnational activities in the national accounts. Cancels forest credits in the registry once they are transferred to buyers. Maintains a risk management mechanism to help address nonpermanence (e.g., a set-aside from REDD activities) that can be used to make a country's accounts whole in the event of reversal.

21 UNFCCC, "JI Guidelines," FCCC/KP/CMP/2005/8/Add.2, Decision 12/CMP.1, http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf (accessed February 2, 2009); and Stockholm Institute book.

Component	Track 1	Track 2
Designated national authority (DNA)	Issues credits to projects and programs with in-country supervision that oversees methodologies and project approval. The DNA or other nationally designated entity may oversee distribution of income from REDD credits. Maintains a risk management mechanism to help address nonpermanence (e.g., government backing or a set-aside from REDD activities) that can be used to make a country's accounts whole in the event of reversal.	Ensures project and programs meet national standards and requirements. DNA or other nationally designated entity may oversee distribution of income from REDD credits.
International transaction log (ITL)	Verifies and tracks transaction across all different national (seller and buyer) registries. Enables conversion of offset credits into compliance allowances. Avoids double counting.	Same as Track 1
Global (or buyer nation) oversight body (GOB)	Oversees national MRV and other criteria for credits; conducts audits of accounting and management.	Same as Track 1
International market stabilizer	If forest carbon is trading on the emissions market, this institution could operate as a backstop to intervene in the case of potentially ruinous losses for developing countries and private financial institutions invested in these countries. An IMF-like body for forest carbon.	Same as Track 1
International dispute or grievance mechanism	To allow developed and developing countries, private investors, and involved third-party organizations a venue to address disputes or grievances.	Same as Track 1

National forest carbon registries are only for countries in Track 1 who are able and want to manage projects, methodologies, and accounting and reconciliation themselves. A standardized computerized system of accounts to keep track of transactions, acquisitions, cancellations, and retirements of all REDD credits, both for national and other legal entities able to hold credits (e.g., project overseers), would be required. The registry would need to ensure transparent and efficient exchange with buyer nation registries and the international transaction log, and have comparability with other participating tropical forest nations' national forest carbon registries. In contrast, international forest carbon registries are managed by and an international body and required for countries in Track 2. By having one body oversee projects and crediting for multiple forest countries, efficiencies of scale and consistency are likely greater. This registry could be structured similarly to the CDM registry, such that an international authority, rather than the host country, is responsible for subnational accounting. The international registry would be overseen by an International REDD Supervisory Committee that would also issue REDD credits to the appropriate parties. With national-level accounting, the registries play a critical role of reconciling subnational and project-level activities with the national accounts. A country will need to track these activities and have a process for compensating them relative to the overall compensation received for the country based on its national performance.

A **designated national authority (DNA)** can control the creation, use, and licensing of forest credits within countries, which is the same role these entities play for the CDM.[22] They approve projects, confirming their

22 Niles, John O., "Driving Private Capital to Conserve Tropical Forests: Current Frameworks & Policy Ideas," in Final Report of the Forest Carbon Finance Summit 2009: Making Forest Carbon Markets Work, Harvard Law School Program on International Finance Systems, Washington, D.C., March 6–8, 2009, http://www.law.harvard.edu/programs/about/pifs/symposia/fcfs/09-fcfs-final-report.pdf.

voluntary participation and confirming that the activity assists the country to achieve sustainable development. DNA's control the creation, use, and licensing of credits within countries. In a Track 1–type arrangement DNAs could have clear national authority to integrate data, meet bilateral /international law and legal obligations (including methodologies and monitoring and liabilities for reversals), and have clear authority to engage forest carbon investors. DNAs can help address forest nation concerns over nationalization by establishing national rules and guidance. A DNA could be a government agency, an independent NGO, or private company designated by the government. They are the in-country institution that links to the international body.

The **international transaction Log (ITL)** would be maintained by the UN secretariat under a multilateral regime (or perhaps the domestic agency in charge for bilateral arrangements such as proposed in U.S. legislation). The log verifies the validity of all transactions between developed country (buyers) national registries, national forest carbon registries, and the international forest carbon registry. Prior to any transaction, a unique transaction number can be issued and a transaction record made available to the ITL secretariat or agency. The secretariat or agency can conduct an automated check to verify the validity and consistency of the proposed transaction. If a discrepancy exists, the initiating party can hold these credits until the error has been worked out. The ITL can help ensure that a country's forest credits that are transferred to buyers are canceled in that countries' national registry.

A **global (or buyer nation) oversight body/facility (GOB)** could be formed initially by the new global climate treaty or could grow out of Phase 1 and 2 institutions that oversee earlier activities. This body would need to assess MRV capabilities and accounting systems; evaluate forest nations or other UN or buyer nation performance versus required criteria; and conduct periodic audits for all of these to assure quality of the credits. It might also need the enforcement authority to block (or discount) forest carbon transactions from countries that fail to meet established requirements, but this is an issue of international law that would need to be examined more carefully.

An **international forest carbon emergency facility (FCEF)** would be an insurance facility, linked to the GOB, which would decide a percentage of each country's carbon that would be credited for compliance versus the percentage to be held back in reserve based upon an assessed level of risk of reversal. If the facility were global or regional (as opposed to national), it would have the advantage of holding a diversified pool of unsold credits, and in the event of an emergency such as a major fire or drought could dip into the "pool" to provide the country in need a "loan" of credits. This "emergency relief" loan would allow that country to continue to meet the reasonable expectations of the complying projects and the forest communities that depend on them. Without this relief, one could imagine immediate financial pressure in the local forest communities to revert to old patterns of behavior, including deforestation, and thus in turn further compounding the country's excess emissions.

Thus, the facility would act as an international market stabilizer, providing both "insurance" and "emergency relief" functions, akin to the IMF, for carbon. In the case of an extreme event, one could even envisage a multiyear rescue package being constructed between the FCEF and the country whereby there would be a large loan to the country, disbursed over several years, accompanied by an agreed plan to reforest the damaged areas or apply REDD to new areas. The country would agree to follow the plan that would bring it back under the emissions baseline. To repay the loan and to replenish the pool, the country would agree that a higher percentage of its REDD credits would be reserved by the FCEF for a period. This example illustrates the obvious advantage of this "Carbon IMF" having a global or large regional scale in order to have geographic diversification of risk and sufficient size to handle large events. It may also need backstop financing and credit lines from the World Bank or other regional agencies, especially in the early years while the credit the pool is in the accumulation phase.[23]

23 Kanak D., "Reflections of a Summit Organizer: Overview of the Discussion about Forest Carbon Markets," in Final Report of the Forest Carbon Finance Summit 2009: Making Forest Carbon Markets Work, Harvard Law School Program on International Finance Systems, Washington, D.C., March 6–8, 2009, http://www.law.harvard.edu/programs/about/pifs/symposia/fcfs/09-fcfs-final-report.pdf.

An **international dispute or grievance mechanism** could be developed to allow developed and developing country governments, private investors, and involved third-party organizations—which might include developing country NGOs or citizen groups, developed country NGOs, or organizations involved in capacity building or MRV—to settle disputes and address grievances. Such a mechanism might help assure stakeholder groups of a continuing voice and added transparency in the system, but could also raise concerns about endless litigation. Efforts are needed to understand existing examples to help build an effective and efficient mechanism.

4.2. Flexibility for first forest carbon transactions

Given the urgency to reduce deforestation fast to avoid additional emissions, policymakers and stakeholders have expressed the need to move quickly to implement REDD. Capped industry representatives and some NGOs, particularly the in the United States, see a need for projects and subnational activities to be credited through a market mechanism before the national-level details (agreed-upon baseline, accounting structures, etc.) are all worked out. This emphasis on speed is in part to produce REDD offsets for early cost containment for their national climate programs, and also to promote rapid on-the-ground learning.[24] To move quickly before the institutions, standards, and risk management structure described above are in place puts the quality of the REDD result at risk. How to balance these competing needs is a difficult question. One alternative is to have early activities financed through funds or set-asides to avoid generating forest carbon credits that may have lower or uncertain integrity, which could undermine support for broader forest carbon support and could weaken progress toward reducing overall global emissions. However, sufficient funds are not available now and may not be forthcoming until developed countries have their climate policies in place, which may be 2012 at the earliest.

As indicated above, the Waxman-Markey bill that passed in the U.S. House of Representatives on June 26, 2009[25] includes both set-aside (fund) and market options. The bill is set up so that either a "fund" or "market" approach can be used depending how bilateral or multilateral agreements are designed. In each of these there is language that leaves the door open to subnational and project-level activities, at least in the near term, to be phased out as an inducement for full national accounting to eventually underlie all transactions. Whether the specific details of the mechanism proposed in the Waxman-Markey House bill—a first attempt to balance these competing needs—will be sufficient is now under debate in the U.S. Senate.

The inclusion of subnational and project-based activity remains an area of disagreement among groups otherwise supportive of REDD. Questions that are worth exploring are:

- Will there be sufficient funds to result in significant early on-the-ground emission reductions from the supplemental (set-aside) funds from the U.S. and other developed market climate policies without market finance?
- Will keeping early subnational and project-level REDD out of the compliance market or limiting their eligibility eliminate a critical source for expected financing for early REDD, and as a result limit a primary source of early cost containment for compliance regimes? If so, how should this be addressed?
- Is it possible to include these early subnational activities in the market but discount them sufficiently conservatively that the risks will be covered?

Following the logic of this third point, one proposal for including subnational and REDD project-level activities is to use a mechanism like the CDM, where an international entity/board oversees all activities and acts as an intermediary between countries' DNAs, in-country actors, and private investors. Any credits generated could

24 For example, members of the Forest Carbon Dialogue includes corporations such as American Electric Power (AEP), John Deere, Shell, Duke Energy and PG&E as well as conservation organizations such as The Nature Conservancy (TNC), Environmental Defense Fund (EDF), the Woods Hole Research Center and the Wildlife Conservation Society (WCS).

25 http://energycommerce.house.gov/Press_111/20090515/hr2454.pdf.

be significantly discounted to allay concerns about additionality, leakage, and other quality factors.[26] Different grades could be assigned to reductions based on assessment of quality. The rationale for this is the flexibility to have REDD activity enter at different stages, progressively more rigorous (with higher market reward), ranging from lower grades with more conservative crediting (subnational/project [CDM]) to higher grades with fuller crediting (national program with system-wide accounting). Conservative crediting acts as a form of insurance for reduction units in the earlier phases of a program when the full set of compliance-grade criteria are not all met. Yet, some questions remain. If the crediting were not conservative enough, who (buyer or seller), if anyone, would be liable for any resultant overcrediting? Conversely, if crediting were too conservative, could the surplus credits go to the party that held the risk of overcrediting? Or could an early CDM-like program be limited in scale so that the potential environmental damages (overcrediting) would be contained and acceptable in helping to initiate a broader program?

An approach that might balance the needs for advance funding and risk of quality during Phases 1 and 2, would be "banking" of issued credits. Under this plan, a capped country or entity could purchase REDD offsets, but those credits, rather than being heavily discounted would be "held back" (not used for compliance purposes) until the REDD country of origin had graduated to Phase 3 and the certifying body validated that the credits were in fact MRV. This would introduce risk of credit non-acceptance into the equation, which would likely manifest itself in a discount on banked credits. But by essentially holding these credits in escrow until the host country program is fully approved, this obviates problems with recalling or defaulting credits that have already been circulating and creating liability problems for market participants. It is possible that the uncertainties inherent in such an approach would limit investment in early REDD.

26 Discounting of credits to reflect higher uncertainty of deliverability or sustainability will require robust methodologies and capabilities to verify. Discounting by buffers or reserves is well practiced in voluntary forest carbon certification. See Voluntary Carbon Standard, "Tool for AFOLU Non-Permanence Risk Analysis and Buffer Determination, at http://www.v-c-s.org/afl.html (site as of August 18, 2009); for a legal analysis of discounting aimed at cost more than risk quality, see A. Schatz, "Discounting the Clean Development Mechanism," Georgetown Environmental Law Review 20 (2008): 703–742.

5. Conclusions

To rapidly slow and reverse climate change and try to avert some of the most dangerous impacts of global warming requires staying below 450 ppm of GHG in the atmosphere. That requires effective and immediate action. The actions taken and investments made must produce real and sustained GHG sequestration or emission reductions. The forestry sector globally is an essential part of the solution because of the relatively large scale and low cost of mitigation actions. Whether forest carbon is tied to the compliance markets of developed countries or financed through a fund, the outcome must be real. In either case, quality is essential for forest carbon to be a viable component of an effective mitigation strategy.

Achieving high-quality forest carbon mitigation will require new levels of coordination on several fronts: national and international governance, public and private sector participation, institution and capacity building, monitoring of land use and financial flows for unprecedented global transparency, and international regulatory compliance. Accomplishing these tasks and building the necessary national and international infrastructure will take time. Because not all countries and processes will move at the same pace, flexibility will be needed—but not at the expense of the long-term integrity of REDD. For example, it is not clear whether the UNFCCC or the United States will move first in setting rules for forest carbon's role in the mitigation portfolio. Efforts will be necessary to align these systems if they develop along different paths. REDD countries will also move at different speeds in different places and will want to manage forest carbon programs differently. Because any new program will have its wrinkles, there may be more uncertainty around the quality of early tons. However, these wrinkles need to be worked out to ensure the necessary long-run integrity.

One of the more difficult challenges is to find ways to move quickly, not delaying so long that forests disappear, without risking too much loss of integrity or quality. Distributing finances quickly may not always be in the best interest of distributing them effectively, as all institutions and oversight may not be in place.[27] An effort is needed to ensure in the short term (Phase 1) that adequate financing is raised to jump-start real change in REDD countries; although these activities will not bring the certainty required in the long term, they will generate real-world knowledge, data, and experience. Both the scale and the quality of the "jump-start" must be regulated carefully to avoid compromising the integrity of the system, or slowing down the progress toward the end game (Phase 3). The recently passed Waxman-Markey bill (H.R. 2454) in the U.S. Congress tries to strike this type of compromise, but may not have all the details right. It is not clear yet how this might proceed in the UNFCCC process.

27 A recent scandal surrounding efforts to generate early credits from REDD in Papua New Guinea prior to the rules of the game being firmly established underscores the risk associated with moving too quickly. See Marian Wilkinson and Ben Cubby, "Carbon Scandal Snares Australian Company," Farm Weekly, April 9, 2009, http://fw.farmonline.com.au/news/nationalrural/agribusiness-and-general/general/carbon-scandal-snares-australian-company/1614446.aspx.

Appendix: Example Details for Phases of REDD Development

This appendix includes three tables that attempt to define basic requirements for the three main financing phases described in the main text. These phases are steps in a process which is likely to be a continuum with some characteristics of earlier phases (e.g., Phase 1) being present in the early stages of later phases (e.g., Phase 2). These tables present ideas and options to describe how these phases could work. They are not intended to be prescriptive; rather, they are elements of a discussion that must happen for the quality of REDD credits to evolve to compliance-grade.

Table A1. Phase 1 example requirements.

Criterion	Requirements
Required initial conditions	A REDD country must have a relatively stable government and high-level government engagement, must agree to conduct national planning, must have strong legal and regulatory frameworks to identify and enforce property rights and laws, and must have a demonstrated ability to develop partnerships with internal parties (e.g., NGOs, affected communities) and external organizations (e.g., international intermediaries) to participate in national planning. It must demonstrate satisfactory commitment to environmental and social standards and enforcement principles. A developed country or global facility must be in place to manage the oversight and transfer of funds. Developed and REDD countries must have reached an agreement (UNFCCC treaty or other).
Objectives	REDD countries develop a national strategy; build and strengthen institutions and capacity; build engagement networks (with civil society, local communities, in-country experts, and international organizations); develop MRV capabilities, including agreement on a national interim baseline (e.g., trajectory of forest cover); initiate demonstration activities; designate clear government authority; and initiate national programs to reduce forest sector emissions (these can transition to Phase 2).
Finance mechanisms	Donations from developed-country governments, earmarks from the auctioning of domestic allowances, or some other levy on climate-related transactions are used to create a fund for REDD activities. In the initial years before any developed country cap-and-trade program is in place or ready to fund REDD (at least until 2012), donations will be the only source of funding, unless an international REDD financing regime emerges quickly out of Copenhagen. *and* Some level of developing country self-financing as part of its "common but differentiated" responsibilities may be in order.
Financing institutions	International institutions linking donor and REDD countries that assist in all aspects of Phase 1 efforts and provide oversight (e.g., World Bank's Forest Carbon Partnership Facility and UN Collaborative Programme [UN-REDD] and other bilateral initiatives). The need to coordinate these efforts has been recognized.
Role of private finance	Private funders can supplement by adding to donor (e.g., World Bank) funding or by funding relevant activities that fall outside the scope of the official process (e.g., buying up forests that are at risk now). Privately funded pilot projects can be established to gain experience, but without clear rules for whether or how these investments would qualify for compliance crediting, the amount of private funding would be limited.
Oversight	Global financing institutions or third-party organizations use indicators of performance to assess progress and determine funding and institutional assistance based on performance and need, determine whether and how funding continues past first funding period, and determine whether a country is ready to transition to Phase 2. A DNA can be created to provide national-level oversight to internationally funded initiatives.
Indicators of Performance	Performance metrics could include completion of viable national REDD strategy; clear development of institutional networks to engage impacted local communities; progress toward development of a national MRV system that is acceptable to scientific advisors; progress in creating new national institutions for oversight of REDD efforts; and sufficient strengthening of governance, transparency, and legal systems if needed.

Criterion	Requirements
Limitations for funding	Phase 1 funding for a country is likely available for a limited time. An extension may be earned if significant progress is made, after which countries would be required to move to Phase 2 to continue receiving funding. Failed efforts could be lost from the system or may have to overcome past barriers to success (stability, institutional limits, governance limits) before reapplying for Phase 1 funding. Countries that do not participate—whether they attempted to join the REDD process and failed or never attempted—will create risks for leakage and system integrity; thus, efforts will be needed to bring these "dropped" countries onboard with more successful approaches.

Table A2. Phase 2 example requirements.

Criterion	Requirements
Required Initial conditions	A REDD country must have its national REDD strategy complete, including a critical review of forest sector and conservation efforts; evidence of a transparent participatory process for engaging impacted communities and other stakeholders; an agreed-upon strategy that has been approved by supporting governing bodies (be they international or bilateral); an institutional framework and capacity in place to initiate strategy with national accounting and management (likely within a DNA); and sufficient legal structure to address grievances and fraud. They must also have sufficient MRV to measure against the agreed-upon interim baseline (trajectory of forest change). The developed country or international community providing financing must have a multilateral or global facility to manage oversight and transfer of funds.
Objectives	REDD countries implement national REDD plans, which include enacting national policies and implementing programs (e.g., agricultural sector reforms, clarifying land or carbon rights, coordinating land management, and enhancing enforcement); engaging REDD stakeholder networks; testing institutions; continuing development of MRV so it can move from performance-based to outcome based measurement and monitoring; an agreed-upon national emissions baseline; piloting projects and subnational programs with national accounting; and building a risk management system/program.
Finance mechanisms	Developed countries provide a reliable funding source over a defined period, possibly through a set-aside from the auctioning of domestic allowances as suggested by proposed U.S. legislation and called for in the 2008 EU resolution[28] or through some other levy on climate-related transactions. For countries entering Phase 2 prior to the onset of these funding sources, an alternative, such as the FCPF or UN-REDD, will be needed. Tying funding to new markets rather than depending on yearly earmarks for development assistance can reduce vulnerability to budgetary considerations and shifting policy priorities of developed nations, although market price fluctuations could factor in to add another variable. ODA may still play an important role, particularly in achieving complementary objectives that are not central to forest carbon (e.g., protecting water and biodiversity, increasing agricultural productivity, and improving civil society engagement). Some level of developing country self-financing as part of its "common but differentiated" responsibilities may be in order.
Financing institutions	See Table A1
Role of private finance	Some incentives for early action and learning-by-doing may be necessary prior to the "flood gates" of the Phase 3 compliance market. Privately financed pilot projects could be developed for compliance markets if the use of such projects is allowed by both the tropical forest nation and developed country programs. Private funders can supplement by funding relevant activities that fall outside the scope of the official process.
Legality	A REDD country must have a domestic legal framework for determining forest carbon rights; it must have adequate safeguards for indigenous and forest people; and it must have REDD-enabling laws in place, including designated authorities for REDD-strategy and project/program approvals, certification, verification, and enforcement. DNA or adequate national authority and competence for land-use planning, including agriculture, and food needs.

28 While the 2008 EU resolution called for allocation to REDD, these funds have since been frozen. Resolution and amendments to Commission Proposal to improve and extend the greenhouse gas emission allowance trading system of the Community (Dec. 17). http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P6-TA-2008-0610+0+DOC+XML+V0//EN&language=EN.

Criterion	Requirements
Oversight	Internationally sanctioned global facility or, absent that, financing country would provide oversight of (1) MRV of performance (e.g., change in forest cover relative to a baseline) which may be used to set funding levels; (2) distribution of funds; (3) assessing performance of nonforest metrics (e.g., stakeholder participation, transparency of financial flows); and (4) deciding whether Phase 3 conditions have been met.
Indicators of performance	Performance metrics for financing could be changes in area deforested relative to an agreed-upon baseline (as noted above) or other measures of carbon stock change as these become available. Other indicators of program performance could also be tracked and could affect financing levels. Performance metrics for advancement to Phase 3 will likely assess accomplishment of the objectives described above.
Limitations for funding	Financing period for Phase 2 would likely be limited in time, both in terms of financing available through developed country policies (commitment to allowance set-aside may be limited in time). Countries that do not participate—whether they attempted to join the REDD process and failed or never attempted—will create risks for leakage and system integrity; thus, efforts will be needed to bring these "dropped" countries onboard with more successful approaches.

Table A3. Phase 3 example requirements.

Criterion	Requirements
Required initial conditions	National REDD strategy and action plan; institutions and capacity successfully implemented and built. An agreed-upon national forest emissions baseline and a tested MRV system sufficient for national accounting and reconciliation. Developed-country or preferably global/UN-sanctioned facility to manage oversight and transfer of funds.
Objectives	National-level accounting and reconciliation. Long-term sustainable program to fund and produce reduced emissions from deforestation (and perhaps forest degradation and carbon stock enhancement), under which forest carbon storage is maintained. Determination of sustainability is based on initial plans and capacity to implement and enforce land use, and meet long-term needs for food, fiber, and fuel consistent with the plans for avoided deforestation. Sufficient risk management in place to address moderate to high risks of reversals.
Finance mechanisms	Reliable long-term funding through national or global emissions trading (compliance) markets. Additional or alternative financing from a set-aside from the auctioning of domestic allowances from developed countries or through some other levy on climate-related transactions. ODA could still play an important role in complementary efforts.
Financing institutions	See Table 3 in main text
Role of private finance	For countries allowing or encouraging private financing, the third phase would permit the full crediting of complying projects to qualify for compliance funding where the country and the project meet the established criteria; in addition to carbon-specific rules and protocols, the elements of country-level attractiveness to direct investment (e.g., national treatment of foreign investment, transparent regulatory regimes, enforceability of contracts, etc.) will also be key determinants of the availability of private financing. Again, private finance can also supplement the primary REDD program to achieve additional objectives.
Oversight	Financing country or global facility would provide oversight of (1) MRV of performance (change in forest emissions relative to a baseline) which determines compensation and (2) distribution of funds and performance of nonforest metrics (e.g., stakeholder participation, transparency of financial flows) if this is required by the purchasers.

Criterion	Requirements
Indicators of performance	Performance metric to determine compensation would likely be the change in forest emissions relative to an agreed-upon baseline. Additional performance metrics may be required by purchasers. Failure to meet requirements—such as requiring REDD countries to hold a risk buffer that meet certain standards—may affect future compensation (ability to access certain markets or receive funds from certain funders).
Limitations for funding	REDD countries can have financing stopped or limited due to poor performance—e.g., substantial reversals of avoided emissions—which could cause purchasers to block access to their markets or funds until corrections are addressed in acceptable manner. If this happens, efforts will be needed to consider/address leakage. Developed countries can limit financing by not allowing REDD into their compliance markets or not providing sufficient funding through set-asides.

the Nicholas Institute

The Nicholas Institute for Environmental Policy Solutions at Duke University is a nonpartisan institute founded in 2005 to engage with decision makers in government, the private sector and the nonprofit community to develop innovative proposals that address critical environmental challenges. The Institute seeks to act as an "honest broker" in policy debates by fostering open, ongoing dialogue between stakeholders on all sides of the issues and by providing decision makers with timely and trustworthy policy-relevant analysis based on academic research. The Institute, working in conjunction with the Nicholas School of the Environment, leverages the broad expertise of Duke University as well as public and private partners nationwide.

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