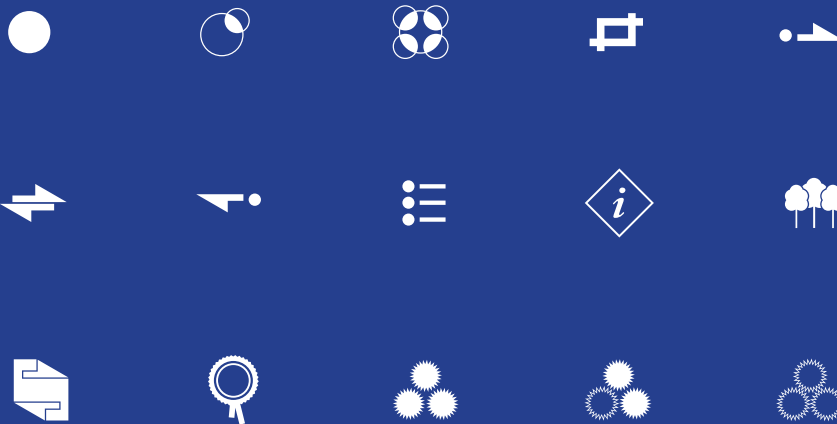


A System to Deliver Terrestrial Carbon Mitigation (REDD+ to AFOLU)

Functions, Institutions
and Transition Pathways



	Implementation
	National Oversight
	International Oversight
	Establishing Framework
	Production
	Transaction
	Consumption
	Guidance
	Rule Setting
	Generation of Mitigation
	Certification of Mitigation
	Facilitate Transaction
	Essential for all Models
	Essential for some Models
	Essential in no Models but Optional

Avoiding dangerous climate change requires a multifaceted response. Terrestrial carbon (including trees, soil, and peat) is a critical untapped element of that response. Deforestation and the degradation of forests and peatlands in the tropics of developing nations currently cause the vast majority of terrestrial carbon emissions.

The Terrestrial Carbon Group came together to develop policy recommendations to unlock the potential of terrestrial carbon. It is an international group of specialists from science, economics, and public policy with expertise in land management, climate change, and markets. The Group has experience in nations and regions where land use is a significant source of greenhouse gas emissions, in nations and regions where land use could sequester atmospheric greenhouse gas, and in nations and regions with existing and emerging carbon markets. The Terrestrial Carbon Group is supported by a Secretariat that runs the Terrestrial Carbon Group Project.

The objective of the Terrestrial Carbon Group is for terrestrial carbon to be effectively included in the international response to climate change.

This Terrestrial Carbon Group Project report provides details of a multinational system to do so in support of: (a) ongoing global negotiations on reducing emissions from deforestation and degradation (REDD) under the United Nations Framework Convention on Climate Change and Kyoto Protocol; and (b) other emerging national, bilateral, and multi-national efforts to maintain and enhance terrestrial carbon.

A System to Deliver Terrestrial Carbon Mitigation (REDD+ to AFOLU)

The Terrestrial Carbon Group Project

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Co-authors:

Anna Creed and Tanja Havemann

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Executive Summary

Any solution to climate change must include the better management, at scale, of terrestrial carbon in the agriculture, forestry and other land use sectors (AFOLU). This includes carbon stored in forests, peatlands, vegetation, and soils.

Recognising the significance of this sector, it is expected that governments will soon agree, under the auspices of the UNFCCC, to create new incentives across the developing world for forests via REDD+ . Further, a number of government and non-government institutions are already undertaking initiatives to address emissions and enhance sequestrations from terrestrial sources in anticipation of this agreement and based on other emerging national, bilateral and multilateral arrangements.

These initiatives are geared towards creating and maintaining an incentive system in which developing countries voluntarily deliver terrestrial carbon mitigation in exchange for financial incentives from developed countries.

As is evidenced by the variety of approaches in these initiatives and proposals, it is clear that there is no “one size fits all” solution. There are many different possible models of operation, which vary by (and can be defined by) the nature of the international agreement, what incentives are offered for, the sources of monies, and the collation and disbursement mechanisms to deliver these incentives.

The specific model of operation adopted by each country will reflect their policy and implementation choices and the speed with which they can adopt appropriate land management practices. Countries will choose to establish and participate in the model that is right for them given their circumstances and preferences. Therefore, the incentives system might not be a single unified construct, but could be realized through various different and co-existing models of operation.

Accommodating this variety of models might appear an insurmountable challenge. However, proposals and initiatives to date all incorporate some element of payment for performance. This implies that the system must incorporate demand from consumers, supply from producers, and rewards based on certified units of production provided through some form of transaction. In this respect it is analogous to a standard trading system where goods are produced, transacted and consumed.

Taking into account the variety of possible models, the ultimate “end state” vision is a coherent, harmonized incentives system, even if made up of a number of models. The objective of this system is to deliver the climate-related impact by incentivizing better management of all land use classes at all scales (from on-the-ground implementation through to national accounting) through results-based payments.

A period of transition to this end state will be necessary, most notably including forests now and expanding to other land use classes over time as knowledge and capabilities allow. The success of this system will be judged by how well it meets the widely agreed criteria of environmental effectiveness, economic efficiency, and equity. It must also integrate relevant safeguards to address critical issues such as local livelihoods and biodiversity.

This report identifies the key components of a flexible multinational incentive system to deliver climate change mitigation from terrestrial carbon management. Specifically, “what needs to be done” (the functions) to create and maintain the system, and “who could fulfil these functions” (ie, which institutions). It also considers how the system can be scaled up from the immediately possible to the ultimately necessary. It draws on ideas, lessons and precedents in the existing carbon incentive schemes (encompassing CDM and JI), existing REDD+ proposals, and other analogous commodity markets.

In terms of what needs to be done to create and maintain this system, this report identifies 31 functions at the implementation, national-oversight and international-oversight levels.

- “Implementation”: Where mitigation is generated and first subject to measurement, monitoring, reporting and verification (MRV) and accounting. These functions are essential under all models of operation as the generation of real emissions reductions is the objective of the system.
- “National Oversight”: Where national planning, rule setting and support activities are undertaken, and second stage MRV and accounting occur. The majority of these are also essential under all models of operation as it is envisaged that delivery at scale will require effective national planning and co-ordination, and also that nation states will be signatories to any agreement and therefore be responsible for any potential liability for non-performance.
- “International Oversight”: Where international rule setting, support and transaction facilitation take place, and where third stage MRV and accounting potentially occur. The greatest functional optionality exists at this level based on whether nation states are bound by international governance, and based on the nature of the collation and distribution mechanism for incentives (such as an international fund or the use of compliance markets). However, even where there are no explicit international reporting requirements, international guidance and standard setting is desirable to ensure compatibility and comparability between countries and participants so that accurate reconciliations and consolidations can be made at the global level.

These functions fall into five categories: “Guidance”, “Rule Setting”, “Generation of Mitigation”, “Certification of Mitigation” and “Facilitate Transaction”.

The good news is that despite the multiplicity of potential operating models to deliver incentives in exchange for terrestrial carbon mitigation, a common functional underpinning can be identified across these models. This is very important as it provides a clear vision for action now to develop these functions, even while the exact terms of possible incentive policies, whether from the UNFCCC or other arrangements, remain unclear or undecided. In demonstration of this, this report interprets four existing REDD+ proposals within the functional framework described.

In terms of who could and should fulfil each of these functions, institutional need varies according to the operational scale of the function, the level of independence, and the extent of authority required for effective and credible implementation it. Required institutions can be grouped into five categories: (i) institutions that are overseen by an international supervisory body, (ii) institutions that operate free from oversight by a supervisory body, (iii) national governments, (iv) delegated private or public bodies, including sub-national public entities and (v) other institutions that are neither appointed nor directly overseen by international or national bodies.

The current institutional architecture at the international level for REDD+ is arguably mainly designed to facilitate technical administrative support on a relatively small scale for capacity building, policy reforms and – to a certain extent – investments. At the national level, many developing countries are beginning to put in place the institutional framework required.

A number of institutions exist for a number of these functions. Useful lessons and templates to support new and fledgling REDD+ initiatives and institutions may also be drawn from outside these international and national initiatives. A detailed assessment is required of the international and national capability of existing institutions as a precursor to the mandating and resourcing existing or new institutions as appropriate.

In practice, functions and institutions will be scaled up from early action to full implementation over time as the capacity to deliver these functions is developed. This is generally known as the “phased approach”, which is anticipated to encourage participation and learning and thereby speed full implementation by breaking the process down and providing incentives and support at each stage. This is to some extent contingent on incentives for early action. A complementary strategy to speed implementation is the “two-track approach” whereby countries may utilise functions provided at the international level while national capacity is still developing (as under the Kyoto Protocol’s JI mechanism).

During this transitional period, the nature of the operational model may evolve, for example from payment for readiness plans to payment for certified mitigation, and from public monies distributed via an international fund to private monies distributed via a compliance market transaction. For this reason, the importance of some functions may change over time. For example, aggregator fund type functions may be needed less over time if there is a movement away from international funds supplied with public monies to private sector compliance market solutions.

Given the long-term vision of a system that incentivises mitigation across all land use types, it is also necessary to consider the functional and institutional impacts and requirements of including non-forest land use types.

As the technical capacity for measuring and monitoring mitigation activities from some of these other land uses and gases are at an earlier stage than for forests, it is likely that the

phasing for non-forest land use types will lag behind forests. However, this report finds that many of the same functions – and therefore types of institutions – will be required in this wider incentives system.

Under some circumstances, it will be appropriate to roll these land uses into the functions and the system created for forests and carbon, while in others, it may not. This can only be decided after a country-based review of the technical capacity and potential mitigation activities and an understanding of the drivers that result in emissions (and mitigation).

Turning this vision of a harmonised incentives system into reality requires technical and financial support during the establishment phase, as well as credible signals that sizeable and sustainable monies will be available to reward production of terrestrial carbon mitigation units at scale. Without this, commitment of time and resources by and in developing countries will be difficult to maintain, and full implementation is unlikely to be reached.

In practice, this means binding commitments must be made by developed countries: treaties must be signed and ratified, and monies must continue to flow. Concurrently, developing countries must continue to demonstrate that they are committed to achieving results by undertaking appropriate national level planning and legislative activities, and creating the necessary enabling conditions for public and private sector producers to deliver at scale in a manner that is environmentally effective, economically efficient, and equitable. Transparency will be important here.

In conclusion, this report finds that developing a harmonised incentives system that accommodates a variety of countries and land uses is not an insurmountable challenge. However, in order that significant performance-based incentives are available for REDD+ activities in the next commitment period (starting in 2013), continued and scaled-up development of the identified functions and institutions at the international, national and sub-national levels is essential.

This requires adequate technical and financial support for both “readiness” and “early action”. Critical to this is prioritisation of the essential functions, and comparable and compatible measurement and monitoring methods for mitigation action, including credible quality assurance / quality control procedures. We must start with forests, and provide a clear commitment and timeline for the future inclusion of other land uses.

This is the only way we can ensure that adequate infrastructure is in place to deliver mitigation at scale in time to prevent dangerous climate change.

Based on this analysis, the following recommendations can be made for COP 15, and beyond:

Recommendations

Action at UN Climate Change Meeting in Copenhagen - Commit

Make a binding commitment to:

- Provide the financial and non-financial support needed to establish the system
- Establish a mechanism to supply sufficient monies for certified mitigation over the long term
- Guarantee the eligibility of early action for future incentives
- Follow a time-bound transition pathway to include all land use classes as soon as knowledge and capabilities allow

Action required between 2010 and 2013 – Get Ready

We have three years to prepare this system before the start of the next commitment period in January 2013. Although current capacity is generally low – with notable exceptions – we can get a long way in this time by:

- Continuing and expanding action to initiate and develop the functions needed, across all five identified categories, building on experiences we already have
- Carrying out a detailed assessment of the international and national capability of existing institutions, leading to the mandating and resourcing of existing or new institutions as appropriate

AAU	Assigned Amount Unit
AFOLU	Agriculture, Forestry and Other Land Use
A / R	Afforestation / Reforestation
AIE	Accredited Independent Entity
BNDES	Brazilian Development Bank
CDM	Clean Development Mechanism
CDM EB	CDM Executive Body
CER	Certified Emission Reduction, including long-term CERs (ICERs) and temporary CERs (tCERs)
CO ₂ e	Carbon Dioxide equivalent
COP	Conference of the Parties
DFI	Development Finance Institution
DNA	Designated National Authority
DNB	Designated National Body
DOE	Designated Operational Entity
ERU	Emission Reduction Unit
EU ETS	European Union Emissions Trading Scheme
FAO	United Nations Food and Agriculture Organisation
FCPF	World Bank Forest Carbon Partnership Facility
FIP	World Bank Forest Investment Programme
FONAFIFO	Costa Rican National Forest Fund
GEF	Global Environment Facility
GHG	Greenhouse Gas
Gt	Giga ton
GTOS	Global Terrestrial Observing System
IAB	International Appointed Body
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IEB	International Executive Body
INPE	National Institute for Space Research (Brazil)
IPCC	Intergovernmental Panel on Climate Change
IPPOs	Independent Private or Public Organisations
ITL	International Transaction Log
JI	Joint Implementation
JISC	JI Supervisory Committee
MIGA	Multilateral Investment Guarantee Agency
MRV	Measurement, Monitoring, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Activities
NASA	National Aeronautics and Space Administration (US)
NGO	Non Governmental Organisation
NORAD	Norwegian Agency for Development Cooperation
PAS	Sustainable Amazon Plan
PDD	Project Design Document
REDD+	Reducing Emissions from Deforestation and Degradation plus conservation and sustainable forest management and enhancement of forest carbon stocks in developing countries
RMU	Removal Unit
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD Programme	Collaboration between FAO, UNDP and UNEP on REDD
USAID	United States Agency for International Development
WWF	World Wide Fund for Nature

1. An Incentive System for Terrestrial Carbon Management

1.1 Terrestrial Carbon Mitigation: Policy in the Climate Change Negotiations and Action on the Ground

Improved management of the world's terrestrial carbon in agriculture, forestry, and other land use (AFOLU) sectors, as described by the Intergovernmental Panel on Climate Change (IPCC), is a necessary part of the global effort to avoid dangerous climate change. It represents a combined 12Gt CO₂e of abatement potential globally per annum in 2030, which equates to one third of the overall abatement potential in 2030, a half in 2020¹. In developing countries, it represents 7Gt CO₂e of mitigation² in 2020³, which means that terrestrial carbon in developing countries could therefore provide roughly 40% of the 17Gt CO₂e of mitigation required globally in 2020⁴.

However, this critical developing country component has been largely untapped in the international response to climate change to date.

Action is underway to address this. It is expected that governments will soon agree, under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC), to create new incentives across the developing world for maintaining existing terrestrial carbon (eg, avoiding deforestation and forest degradation) and creating new terrestrial carbon (eg, afforestation, reforestation, and better soil management). This is commonly referred to as "REDD+"⁵, an evolving concept.

Around 40 developing countries are now engaged in REDD+ strategy development and demonstration activities⁶. In addition, a number of countries are undertaking initiatives based on other emerging national, bilateral and multilateral arrangements.

Box 1

Examples of national action

Brazil: Distributing funding for sustainable management of the Amazon

Brazil's Amazon Fund is a private fund created in August 2008 following a Presidential decree. Its purpose is to combat deforestation by implementing and supporting forest conservation and sustainable use practices. It is linked to the 'Sustainable Amazon Plan' (PAS), another fund created to promote sustainable development in the Amazon. Monies can be used to fund for-profit and not-for-profit projects.

\$110m has already been received from the Government of Norway, which has pledged a total of \$1bn over the next 7 years (if it is shown that deforestation has slowed significantly). Germany has also pledged \$18m. It is hoped that around \$21bn will be received over the Fund's first ten years.

Brazil's state-run development bank (BNDES) administers the Fund. Its Board has representatives from government and indigenous communities.

Indonesia: Preparatory legislation

In July 2008, the President established a National Council on Climate Change as a centre for coordination across the many branches of government. In the planning and budgeting process, the working group has included climate change activities into the annual work plan, the financial notes for the state budget, and the medium term development plan for the next five years.

The Government of Indonesia, in particular the Ministry of Forestry, has been developing the legal framework and regulations to implement REDD nationally. The three primary regulations are the forestry decrees issued in 2008 and 2009:

- Permenhut No. 68/2008: "Describes the permission and approval procedures of REDD's demonstration activities, so that the methodologies, technologies and institutions of REDD are practicable and evaluable."

- Permenhut No. 30/2009: "Regulates procedures on the implementation of REDD including requirements that should be fulfilled by developers, verification and certifications, and terms and conditions of REDD's implementing bodies."
- Permenhut No. 36/2009: "Regulates procedures on the implementation of REDD projects through carbon sequestration and storage. It includes revenue sharing, application, collection, depositing, and utilization procedures of revenues from REDD projects. This decree distinguishes between sequestration and storage carbon projects in different types of forests, and between different types of projects."

Reference: REDD-I Legal System On the Implementation of REDD in Indonesia website: <http://redd-indonesia.org/en/laws-regulations/>

These initiatives are being led by forest countries (see Box 1 for examples from Brazil and Indonesia), multilateral agencies (see Box 2 for examples from the UN-REDD Programme and the World Bank), and developed countries (including Australia, Germany, Norway, and the UK).

1. *Pathways to a Low Carbon Economy: Version 2 of the Greenhouse Gas Abatement Cost Curve*, McKinsey & Company 2009. Based on calculation of abatement potential at a cost of less than 60€/tCO₂e.

2. *Mitigation refers to both emission reductions and sequestration.*

3. *McKinsey & Company analysis for Project Catalyst in "Towards the inclusion of forest-based mitigation in a global climate agreement" (Working Draft May 2009). Based on calculation of abatement potential at a cost of less than 60€/tCO₂e.*

4. *McKinsey & Company analysis for Project Catalyst in "Scaling up Climate Finance: Finance briefing paper" (September 2009). Required mitigation is calculated as the difference between business as usual greenhouse gas emissions and the level of emissions required to stay on a pathway to stabilising greenhouse gas concentrations at 450ppm.*

5. *Reducing Emissions from Deforestation and forest Degradation plus conservation and sustainable forest management and enhancement of forest carbon stocks in developing countries.*

6. *REDD+ Institutional Options Assessment: Developing an Efficient, Effective, and Equitable Institutional Framework for REDD+ under the UNFCCC*, by Streck, Gomez-Echeverri, Gutman, Loisel, Werksman. Available at www.REDD-OAR.org.

Box 2

Examples of multilateral support for REDD+ and AFOLU

Initiative	Administrators	Size	Details
UN-REDD Programme	FAO, UNDP, UNEP	Raised \$76m from Governments of Norway, Spain and Denmark	Facilitates the inclusion of REDD provisions post 2012 by supporting capacity to build country-driven REDD strategies and by using its convening power to encourage consensus building.
Forest Carbon Partnership Facility (FCPF)	World Bank	Raised \$107m from 11 countries and 2 private donors (\$51m has been raised for the Carbon Finance Mechanism)	Provides capacity for REDD in developing countries and tests a program of performance related incentive payments. It includes a "Readiness mechanism" which provides technical assistance and capacity building and a "Carbon Finance Mechanism" which will provide financing to 5 countries on the basis of proved mitigation from REDD as a result of pilot activities.
World Bank Biocarbon Fund	World Bank	Two tranches of \$53.8m and \$38.1m respectively from 6 Governments and 15 private organisations	Purchases carbon credits from AFOLU projects, including from A/R, REDD and agricultural activities.
Forest Investment Program (FIP)	World Bank	\$204m pledged by the Governments of UK, Australia and Norway	Support developing countries REDD-readiness, providing up-front bridge financing for readiness reforms and public and private investments identified through national REDD readiness strategy building efforts

1.2 An Incentive System to Deliver Terrestrial Carbon Mitigation

The initiatives outlined above, and others like them, are geared towards creating and maintaining a mechanism to incentivise the creation and delivery of terrestrial carbon mitigation, whether at the sub-national, national or international level. This requires creating policy and translating it to meaningful action, while meeting the widely agreed criteria of environmental effectiveness, economic efficiency and equity⁷.

As a global community, the challenge is to deliver, and pay for, this mitigation at the scale necessary to avoid dangerous climate change. In this report, we talk of a “system” in which developing countries voluntarily deliver terrestrial carbon mitigation in exchange for financial incentives from developed countries.

This incentive system is in some ways analogous to a standard trading system where goods are produced and purchased. In its simplest form, terrestrial carbon mitigation can be viewed as a commodity that is produced, transacted, and consumed. There is flexibility as to what constitutes one unit of the product ie, the terrestrial carbon mitigation. It could be a measurable unit such as a saved hectare of forest, or a Certified Emission Reduction (CER) or sequestration increase, or could be adherence to a policy or measure⁸.

Certainly, it is possible to stretch this trading analogy too far. Carbon is not a natural commodity; rather it is produced as a result of international or national policy. The parameters of supply and demand are fixed by the stringency of greenhouse gas (GHG) emission reduction targets. Additionally, assessing value solely in terms of carbon is dangerous in that it ignores critical issues such as biodiversity and local livelihoods. Relevant safeguards and other provisions can and must be explicitly included as these models are created and implemented and the system develops.

Further, like any trading system, in reality, this incentive system will not be a single unified construct, but will be realized through potentially many different, co-existing, models of operation (“models”), all of which are individually geared to delivering mitigation in exchange for incentives. The existence of a number of models reflects the fact that policy and implementation choices will vary by country according to national circumstances and preferences, and countries will chose to establish or participate in a model which they decide is right for them. Some models may incorporate a number of countries in a common mechanism, for example under a multilateral deal, others may incorporate just two, for example in a bilateral deal. Figure 1 shows a simple schematic of this system, and potential groupings of participants in it.

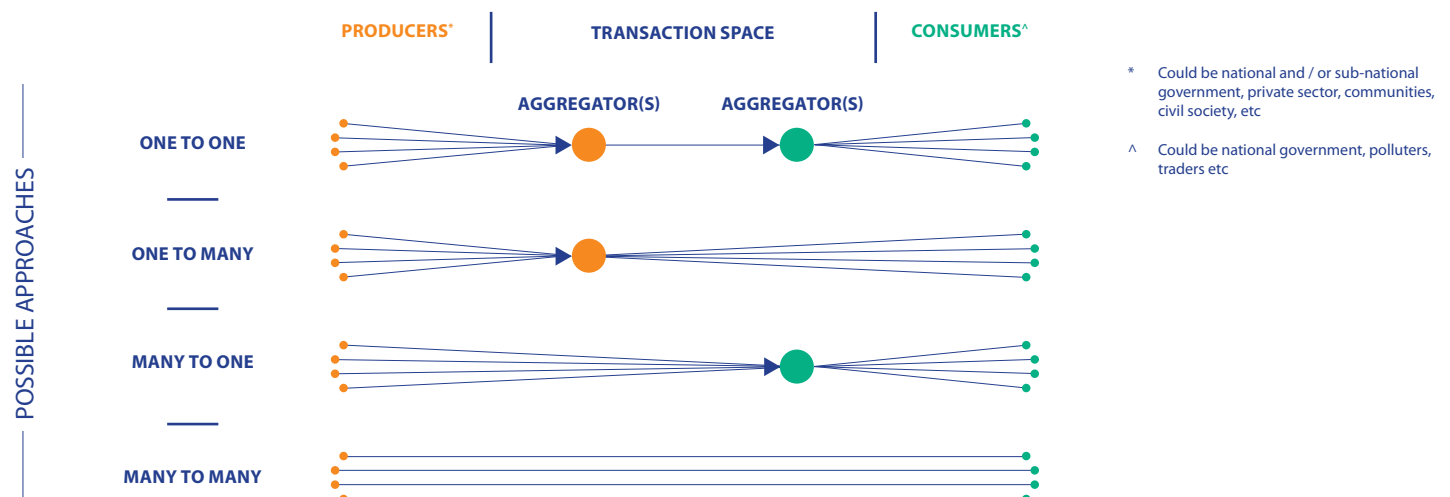
The “end state” vision for this system is the delivery of the maximum climate-related impact by effectively incentivising better management of all land use classes (ie, AFOLU) at all scales, from on-the-ground implementation through to national and possibly global accounting.

It is recognized that a period of transition to this end state will be necessary, especially by starting immediately with forest and possibly peatlands, and building out to all terrestrial carbon and GHGs over time. It is also recognized that within this system different countries will move at different speeds, and utilising specific models of operation tailored to best suit their needs and circumstances.

7. The Stern Review Report on the Economics of Climate Change describes the need for each of these three issues in its comprehensive review. This report can be found at: http://www.hm-treasury.gov.uk/stern_review_report.htm

8. Derivative commodities may also be created, but these subsequent developments and markets are not necessary to the system and are not discussed here.

Figure 1:
A “trading system” for terrestrial carbon mitigation



1.3 Objectives of this Report

The need is pressing⁹. To have the best chance of avoiding dangerous climate change we need to move as quickly as is feasible along transition pathways that will lead to the delivery of terrestrial carbon mitigation at scale, starting with REDD+ and moving to AFOLU.

This report identifies what needs to be done (the functions), by whom, and in what order, to create and maintain the flow of mitigation and incentives. More specifically, it identifies:

- The essential functions that need to be undertaken regardless of the model of operation, the functions required under some models only, and the functions that are always entirely optional.
- Institutional capacities and shortfalls in terms of carrying out those functions, including highlighting precedents that exist and can be leveraged, either in the carbon sector or in other analogous industries and circumstances.
- Timing and sequencing considerations, including identifying the most important functions and institutional capacities and bottlenecks arising from financial, capacity or information constraints, and transition pathways to work through this.

This analysis is informed by, but is not restricted to, REDD+ initiatives and proposals to date, as well as consideration of existing carbon incentive mechanisms and other analogous commodity trades. It also builds on previous analysis of national REDD regulatory and legal frameworks¹⁰, commissioned in partnership with the UN-REDD Programme

1.4 Structure of this Report

The report is structured as follows:

Section 2 presents a schematic of this incentives system for terrestrial carbon mitigation, and lays out the functions required to create and maintain it.

- Section 2.1 explores key design options, combinations of which will define the different models of operation likely to arise.
- Section 2.2 highlights particular considerations when applying the concept of a trading system in this context of terrestrial carbon mitigation.
- Section 2.3 presents the functions that need to be fulfilled within the system, and tells the story of how these could functions link up to effectively deliver terrestrial carbon mitigation in a fully fledged payments-for-performance system. Here we highlight which functions are essential under all models of operation, and which are essential only under some.

- Section 2.4 investigates the common functional underpinnings of different models, to better understand in which contexts each function is essential, or not.
- Section 2.5 tests the trading system schematic and the functions story in the context of four case studies of different models of operation. These case studies are based on proposals put forward by governments and non-governmental organisations.

Section 3 discusses how the system can be built.

- Section 3.1 considers what precedents exist, from which we can learn or borrow in order to develop the essential functions. This incorporates an assessment of the institutional needs and precedents, and an assessment of those functions which might be considered potential "bottlenecks".
- Section 3.2 describes some operational strategies to facilitate the swift transition from early action to full implementation of REDD+.
- Section 3.3 highlights specific considerations and implications in terms of expanding the scope of the system from REDD+ to AFOLU.

Section 4 is an assessment of the underlying configurations of functions of the incentive system, as laid out in Figure 3, against the criteria of environmental effectiveness and economic efficiency¹¹.

9. After GHG concentrations are stabilised, the rate at which the global average temperature increases is expected to slow only within a few decades. Delayed emission reductions significantly constrain the opportunities to achieve lower stabilisation levels and increase the risk of more severe climate change impacts. IPCC 4th Assessment Report 'Climate Change 2007: Synthesis Report'

10. See www.terrestrialcarbon.org/publications for the underlying report commissioned from Covington & Burling LLP and Baker & McKenzie: Background Analysis of REDD Regulatory Frameworks (May 2009) and for the resulting policy brief: Policy Brief 4, Legal and Institutional Foundations for the National Implementation of REDD (June 2009)

11. The Stern Review Report on the Economics of Climate Change describes the need for each for environmental effectiveness, economic efficiency and equity in its comprehensive review. An assessment against the equity criteria falls outside the scope of this report. This report can be found at: http://www.hm-treasury.gov.uk/stern_review_report.htm

2. The System

As noted above, there is a need for the delivery of terrestrial carbon mitigation at scale. But there is no “one size fits all” solution in terms of how incentives can and should be delivered. However, when considered through the lens of “what needs to be done”, there is a common functional underpinning, with limited variation based on context. This is important as it provides a clear path for action now, even while the exact terms of possible incentive policies remain undecided.

2.1 Factors Giving Rise to Different Models for Delivery of Mitigation

National and sub-national circumstances and preferences will likely lead to a variety of models across nations due to differing circumstances and preferences. This is reflected in the variety of proposals put forward to the UNFCCC, by both governmental and non-governmental parties, and in the existence of bilateral and multilateral initiatives.

Furthermore, these models, and therefore the system, are unlikely to be static over time, but to evolve as capabilities and resources develop. For example, it is not currently feasible to properly account for emissions and sequestration from all land use types in all countries. The general consensus is that the state of the science on measuring and monitoring forests is better than for other land use classes¹². Therefore, any incentives may initially be offered for avoided emissions and increased sequestration in forests (ie, REDD+) and encompass a broader scope of terrestrial carbon and other greenhouse gases over time.

Similarly, in certain cases, incentives schemes may initially be contingent on sub-national accounting with the aim of moving to national accounting as quickly as possible.

Our analysis has identified four key factors that define the model of operation, and which therefore need to be taken into account when assessing what functions are needed to deliver mitigation in exchange for incentives. Each of these factors has a number of associated options. These factors and options are shown diagrammatically in Figure 2 and explained below.

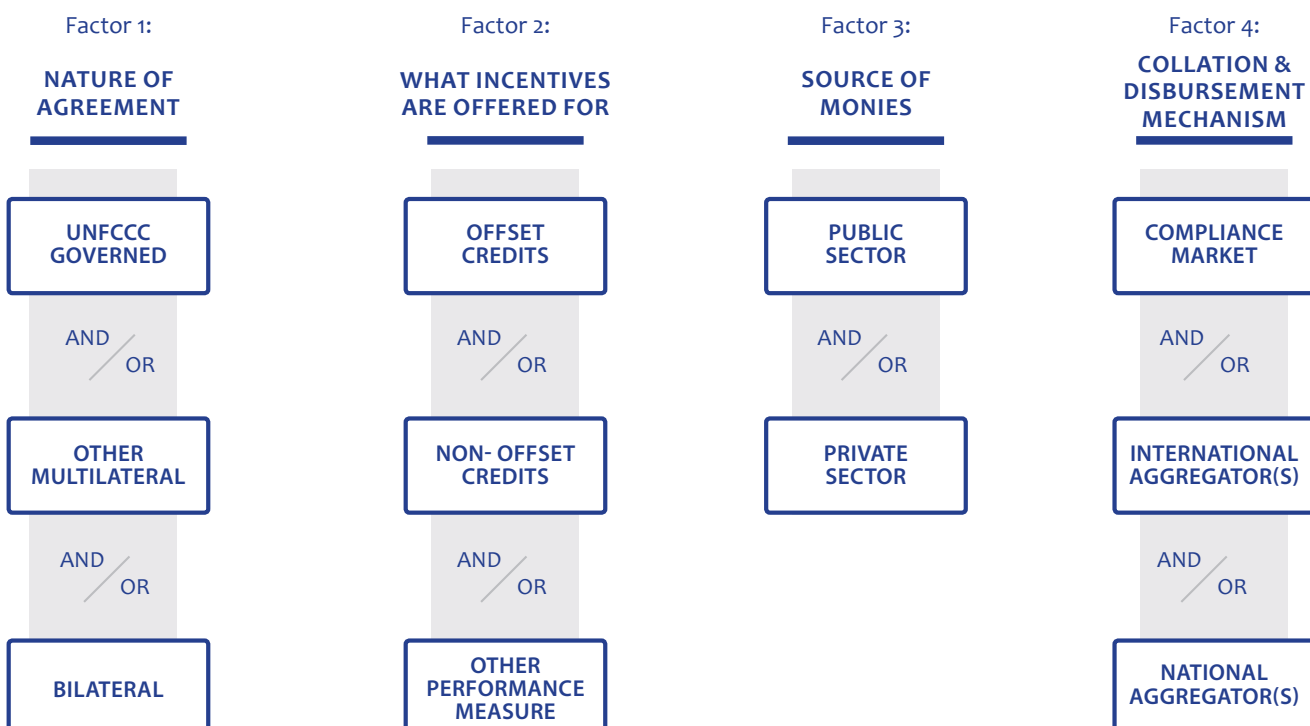
Factor 1: The nature of the agreement.

This could be international agreement(s) through the UNFCCC (by expanding the existing framework of the Clean Development Mechanism (CDM) and Joint Implementation (JI), or including REDD+ into Nationally Appropriate Mitigation Actions (NAMAs)¹³, or setting up a separate mechanism for REDD+), and / or other multilateral and bilateral arrangements¹⁴.

Factor 2: What incentives are offered for.

While there is consensus that payment will be for performance, in practice, performance can be defined as payment for policies and measures at one end of the spectrum up to payment for delivery of credits for offset purposes at the other end. Credits for offset purposes (“offset credits”) are of sufficient quality to be used in meeting binding greenhouse gas emission reduction commitments (domestically or internationally). Credits up to the same quality could be produced but simply retired, rather than used for offset purposes (“non-offset credits”). Other performance measures for which incentives might be offered include effective conservation of forest area, or simply delivery of emissions mitigation plans.

Figure 2:
The four key factors defining a model of operation



Factor 3: Sources of monies to supply those incentives.

This is essentially the question of who is providing the money to pay for the performance. These payments are expected to come from the developed world¹⁵, where it might be sourced from the public and / or the private sector.

Public sector financing is money from the public coffers.

This might be raised at the sub-national, national and / or international level. Options commonly discussed for raising this money include carbon taxes, an aviation tax, revenue from the auction of assigned amount units (AAUs), and/ or redistribution of aid or other fiscal budgets. Private sector financing is money sourced directly from corporate entities. This includes capped entities buying CERs or similar instruments. It also includes philanthropic donations from private entities, organisations, and individuals, but it is anticipated that although potentially strategically significant, these sources of monies will be available on a significantly smaller scale.

Different sources of financing are likely to be available and preferred at different stages of development of the system, from and to different countries, and in respect of different levels of performance.

As noted above, discussion of the “sources of monies” is concerned with “who” is paying. Although often inherently linked to questions over “how” this money is potentially collated and disbursed in exchange for performance, it can usefully be considered distinctly from that “how” question. This related question is addressed in Factor 4 below.

Factor 4: Collation and disbursement mechanisms to deliver payment.

This is essentially “how” this money is collated and disbursed in exchange for performance. It addresses the nature of the relationship between producers and consumers. These parties may engage directly in a transaction via some kind of market place, such as a compliance market, and / or there may be a number of intermediary agents (“aggregators”) placed between producers and end users. Figure 2 shows some of the potential variations in the nature of this relationship.

These aggregators may arise for reasons of efficiency, market power, distributive control, and / or risk-pooling.

For example, an aggregator on the “Production” side can control the distribution of payments to participants, ensure a minimum floor price, help to manage national risk by pooling production, and assist in bringing less well-capitalized initiatives to market.

On the “Consumption” side, an aggregator may enable greater oversight and control over credit quality standards for risk management purposes and / or over prices paid to producers (eg, through a reverse auction mechanism). Sub-national, national and international funds¹⁶ are essentially types of aggregators. These may involve the physical pooling of monies into a single fund, or alternatively, simply oversight and co-ordination of a number of underlying funds.

Notably, such funds, or aggregators can be utilised in conjunction with a compliance market: an aggregator could act as a buffer to manage the flow and price impacts of these credits onto established carbon markets, or alternatively to manage the payments received by producers with the aim of reducing volatility.

12. For more information, please refer to the Terrestrial Carbon Group report: “Background Paper: Measuring and Monitoring Terrestrial Carbon” available from: <http://www.terrestrialcarbon.org/Publications/MeasuringandMonitoring.aspx>

13. NAMA refers to “Nationally Appropriate Mitigation Actions”. The Bali Action Plan (Paragraph 1.b) refers to “enhanced national / international action on mitigation of climate change”. NAMAs are the voluntary plans developed by non-Annex I countries to deliver this mitigation and promote sustainable development which may be supported by Annex I countries and may also require varying degrees of measurement, monitoring, reporting and verification (MRV).

14. For example, government to government with or without the generation and exchange of compliance-grade offsets.

15. Here, REDD+ is anticipated to be a system of voluntary participation, with incentive payments for performance, and without emissions caps for developing countries.

16. For example, a global fund that acts as the sole funding agent for terrestrial carbon activities and also acts as the sole distributor of any compliance grade carbon offsets.

2.2 Considerations when Applying a “Trading System” Concept to an Incentive system for Terrestrial Carbon Mitigation

As noted above, the system is the delivery of terrestrial carbon mitigation in exchange for incentives. This is, in some ways, analogous to a standard trading system of “Production”, “Transaction” and “Consumption”. It is therefore used to provide the framework to present the required functions as presented in Section 2.3.

However, of course, terrestrial carbon mitigation is not a typical commodity. It is therefore insightful, and necessary, to consider the following specific issues when considering the functions required to create and maintain a system for delivering terrestrial carbon mitigation.

- As carbon mitigation is not a natural commodity but is produced as a result of international or national policy, exchange of large volumes of the commodity requires a strong policy and regulatory regime.
- Given the scale of impact required, and the number of stakeholders, the number of potential participants is large and they range in scale (eg, from national governments to small scale farmers). The system must address the needs of all these participants. Figure 1 illustrates the potential arrangements and trading relationships of these participants.
- There are specific investment risks which must be managed: production potential is highest in areas of higher perceived investment and operating risk¹⁷, the underlying carbon asset is not physically exchanged on sale but remains with the producer for ongoing maintenance, and benefits can be negated by actions elsewhere and / or in later periods (eg, spatial or inter-temporal leakage, or forest fires).
- The scale of financing required, the varying purposes for which it is needed (both for up-front investment and payment for performance), and the early stage of most activities determine the need for both private and public sector funding through a variety of structures, including: grant funds, early stage and concessional investment (eg, debt, equity and insurance from Development Finance Institutions, or DFIs), private sector investment and from the purchase of carbon credits¹⁸.

These issues have been encountered in many other sectors, including existing markets, and lessons can be drawn from them.

For example, successful elements of CDM and JI include a relatively visible, transparent and standardised process, governance by an independent and impartial entity, and real and direct private sector participation. Less successful elements include a lack of capacity at the international level which has delayed investments, the adoption of too restrictive testing procedures, delays due to time lags in appropriate guidance, inadequate incentives compared to alternatives, and significant obstacles due to concerns over additionality, permanence and leakage (see Box 3 “Lessons learned from the Clean Development Mechanism and Joint Implementation”).

Alternatively, although not popular with all, the wheat trades in Canada and Australia operated for many years via a “single desk policy” (essentially performing an aggregator type role), in order to group producers for the purpose of greater market access and power and to pool risk (see Box 4 “Production Aggregators: Precedents in the Wheat Trade”).

17. In terms of the OECD country risk rating (0 being best and 10 worst), the 10 countries with the highest volume of volatile forest carbon (vegetative and soil carbon that would be emitted in the event of land use change) have the following risk ratings: Brazil (3), DRC (7), Indonesia (5), China (2), Peru (3), Angola (6), Colombia (4), Bolivia (7), Mexico (3) and Venezuela (7). Information about the top 10 countries by volatile forest carbon can be found in the Terrestrial Carbon Group Policy Brief 1: “Distribution of Terrestrial Carbon Across Developing Countries” (from <http://www.terrestrialcarbon.org/Publications.aspx>) and information on the OECD rating can be found at: <http://www.oecd.org/dataoecd/47/29/3782900.pdf>

18. A more detailed discussion on financing can be found in Forum for the Future: Forest Investment Review, published July 2009. See: http://www.forumforthefuture.org/files/130713_fff_07_FIR_for_web_r4.pdf

Box 3

Lessons learned from the Clean Development Mechanism and Joint Implementation

The CDM and JI are two flexible mechanisms under the Kyoto Protocol. The mechanisms create incentives for project-based activities in countries with no greenhouse gas reduction commitments (CDM) and in those with commitments (JI). However, AFOLU activities are not currently well served by these mechanisms, for the following reasons:

First, there are heavy restrictions on the types of AFOLU activities encompassed by these mechanisms:

- Concerns about additionality, permanence and leakage: due to these concerns, credits generated by AFOLU-type projects (ICERs, tCERs) are not fungible with normal credits (CERs) and effectively banned from the EU Emissions Trading Scheme (EU ETS). Within the CDM, activities were restricted to new forest planting only (ie, A/R). For JI, to A/R and forest management.

Second, although the uptake of the CDM system has been good in respect of non-forestry projects, it has not worked well in respect of the only elements of terrestrial carbon currently included, ie, afforestation and reforestation (A/R). Specific reasons are:

- Time lag to agree rules and guidance: rules and guidance for A/R-projects were agreed significantly later than for other non-forestry project types.
- Inadequate incentives compared to alternatives: When financiers evaluated the merit of A/R CDM projects against other opportunities they found the mix of high upfront costs, long lag time to receive returns and the issue of non-fungible credits unpalatable.

Third, more generally, complaints about the CDM and JI that extend beyond the AFOLU sector are:

- Lack of capacity at the international level: The capacity and institutional structures of the supranational oversight body has not kept up with demand and this has caused some significant delays in approval of project activities, and as a result, investments.
- May not adequately consider country circumstance in terms of ability to apply additionality tests: Project activities must show that they are additional compared to the business as usual situation in the country. Proving this has been very difficult, and as a result, disputed, due to a lack of necessary information to adequately carry out the additionality tests.

Despite these problems, the mechanisms have encouraged significant additional financing to non-AFOLU activities, and in some cases, generated considerable benefits. Some successful elements of which are:

- Relatively visible and transparent process: The process for submitting projects for approval is standardised. All decisions are taken by an international independent expert panel with scope for public review, which results in a relatively transparent decision-making process.
- Governed by an independent and impartial entity: National host governments have a say over which projects should go ahead (ie, projects require approval by a Designated National Authority or DNA), but the final decision is made by an independent international entity.
- Allows real and direct private sector participation: Private developers have good visibility over how a return might be made and the timing and risk of returns. In addition, credits are issued by an international entity rather than by a national government, which in some countries may significantly ameliorate project risk.

Box 4 Production aggregators: precedents in the wheat trade

The Canadian Wheat Board (CWB)

Smaller scale grain producers in Canada established the co-operative Grain Growers Grain Company (GGGC) in the early 1900s. The GGGC bought wheat from participating farmers and sold it on the Winnipeg Grain Exchange on a commission basis. As an extraordinary wartime measure, the federal government established the Board of Grain Supervisors (BGS), mandating it with complete control over the purchase, sale and pricing of wheat for export. This was later replaced with the first Canadian Wheat Board (CWB), selling wheat in domestic and export markets at prices in accordance with world levels. Although the CWB was disbanded after one year, farmers and farm organisations in Western Canada themselves then created three co-operatives and a jointly owned Central Selling Agency (CSA) for wheat. Only when price speculation caused the collapse of the CSA did the government step back in. In 1935 the federal Government re-enacted the CWB. During the second world war, it employed policies of price control and, in order to satisfy supply commitments to European allies, moved from a voluntary system (ie, opt in) to a compulsory system, making the CWB the sole authorised receiver and marketer of Western Canadian wheat.

A government agency for most of its history, the CWB's governance changed in 1999. From 1935 until 1998, the CWB was overseen and managed by federally appointed full-time Commissioners, supported by an Advisory Committee of farmers. In 1999, a 15-member board of directors was put in place, made up of 10 farmer-elected and 5 federal government appointed directors, making it more arms length to the Government and more directly accountable to its farmers. Farmers deliver their wheat throughout the year but there is a two part payment system. They receive an initial, part payment on delivery, and a final payment at the end of the year once the financial results of the sale of the aggregated crop are known. The initial payment is in effect a

floor price, and is guaranteed by the Government. Any losses incurred are absorbed by the Government and any profits are returned to the farmers. The CWB has at various times sold directly or through agents. In the early 1960s, the CWB started making more sales directly to buyers, and started to enter into long-term agreements with other countries. Over time, it has attempted to offer producers more pricing options eg, binding futures contracts from the CWB to attempt to pay them the same price they would get for their grain in the US.

The Australian Wheat Board (AWB)

Founded as a government body in the 1930s, the AWB was initially given the mandate to act as the sole selling agent for Australian wheat producers in the export market. All wheat of a given grade sold through the AWB was pooled and farmers are paid in several stages according to the proportion of the pool that has been sold, rather than being paid in full only when their particular shipment has been sold. The benefits of these commodity pools were distributed to participants in the commodity pool.

In 1999, the AWB was transformed from a government body to a private company and in 2001 was floated on the Australian Stock Exchange. Ownership of class A shares is restricted to currently active wheat growers. Class B shares are freely traded on the Australian Stock Exchange. Class A shareholders elect / appoint nine directors and class B elect two, thereby ensuring currently active wheat growers control of the company. In 2008 the government introduced new legislation that effectively abolished the single desk. There are now 27 companies accredited to export wheat.

2.3 Functions In a Flexible Incentives System

The “map” (Figure 3) illustrates the minimum functions necessary to establish and maintain an incentive system. Each function is represented by a coloured box. The location of each function on the map indicates two factors; the nature of the activity is shown on the vertical axis; its stage in the trading process is shown on the horizontal axis. In order to distinguish between different types of functions, they have also been assigned to five categories: “Support & guidance”, “Rule setting”, “Generation”, “Certification”, or “Facilitating payment”. All functions are described and explained in detail in the Appendix. There are many different ways of fulfilling each function depending on the nature of the agreement and specific national choices on implementation.

On the vertical axis, “Implementation” refers to on-the-ground functions at the level at which mitigation is achieved. This can include activities at the project, sub-national and / or national scale by public and / or private entities. “National Oversight” refers to functions that must be carried out at the national level to govern and oversee “Implementation”. “International Oversight” refers to functions that must be carried out at the international level (by a mix of public and private institutions and entities) to govern and oversee “Implementation” and “National Oversight” functions. These functions are not within the remit of single nation states. It is worth remembering that “National Oversight” functions will need to be provided for (and therefore likely exist in) each participating country, and “Implementation” functions will likely exist in multiple forms within each country,

The horizontal axis should be read from left to right: the first column refers to functions that are necessary in the establishment stage only, although these may be required again if new international rules are agreed (eg, in the case of a future international climate change agreement). In the map, “products” (eg, credits or other policies and measures) flow from left to right and incentives (eg, payments for those products or other policies and measures) in the opposite direction. “Transaction” is the interaction between producers and consumers. Functions that span more than one column of the horizontal axis are required for more than one stage, eg, the “Guidance” is required during all stages.

The majority of functions are required regardless of the exact model adopted (denoted “essential”). A number of the functions are required only under some models (denoted “model-specific”), a small proportion of functions are optional under all models (denoted “optional”).

A simple version of the story of the creation and trade of a product in this system follows. This description is based on a vision of an “end state” where payment is for delivery of credits (which may or may not be used as offsets), and accounting and governance is at the national and international levels. However, rather than precluding activity at the sub-national and project level, this system is built up from and must incentivise such

activity. Furthermore, policy and rule setting at the national and international level should learn from on-the-ground experiences and realities. The actual build-out of these functions is described in Section 3 (“Building the System”).

Overarching functions (ie, those that are required at one or more stage in the process): Guidance on targets and appropriate rules, standards, and practices is needed at all stages in the process. It is provided by a loose network of international oversight bodies. These could continue as a network of organisations, or the environmental, financial, technical and social aspects could be co-ordinated and facilitated by a specifically mandated body, which could be a new or an existing institution. Similarly, international and national arbitrators (with enforcement powers) support the resolution of disputes between countries, and domestic and foreign participants in the country. The “Manage international register” and “License auditors” functions are also overarching functions at the international level, which may be required for “Production”, “Transaction” and “Consumption”.

Establish the Framework: International guidance bodies (eg, the IPCC) advise the body negotiating the agreement (eg, the Conference of the Parties of the UNFCCC, COP) on targets. Negotiators, on behalf of national governments, agree an international treaty or an equivalent agreement. In the case of a bilateral or other multilateral arrangement, an equivalent bilateral or multilateral agreement is signed. Governments ratify the agreement, and enact appropriate regulatory frameworks reflecting national development plans.

Critically, national Governments also decide on the extent to which activities and responsibilities are devolved within the country, including how and by whom incentives may be accessed. This decision should consider and build on existing national policies, eg, on CDM project approval criteria, and must encompass such issues as national safeguard criteria for biodiversity and local livelihoods, production costs (including taxes) and export criteria. If the agreement provides for the use of compliance markets, then the regulators of those markets will need to set the rules for the trade in terrestrial carbon units (production units).

Production: After receiving an implementation mandate from the government (ie, license) the producer can initiate activities, providing finance and any necessary insurance to environmental and financial risk is available. These activities could be initiated and managed by private companies, not-for-profit organisations, and / or government bodies. Activities may occur at any scale within the country, from small-scale projects (eg, individual small-scale farmers) to state- or even nation-wide activities.

Performance would be measured and monitored, results audited, and net mitigation reported to the government (or a delegated body). All auditors are licensed under the authority of an international body. The national government is responsible for registering activities and assessing reports against country-wide measurement and monitoring (though again it may delegate these responsibilities to various public or private sector

bodies). With this information, national accounts and reserves can be prepared and reported to the international auditing and accounting authority (ie, the two international-level functions: "Audit" and "Manage international register"), if the terms of the agreement require international oversight. The international auditing and accounting authority assesses information submitted by national governments against independent measurement and monitoring reports.

Assessed national efforts are entered into an international registry, managed by an appointed body. Global accounts and registers are maintained by an international body, akin to the current CDM Registry under the UNFCCC, in order to monitor overall climate mitigation impacts. If the commodity is offset credits, then a global risk management strategy (eg, to ensure environmental safeguards) may also lead to the development of a credit reserve, which would also be managed by an international body. Credits or other forms of performance payment may be issued either to national governments or to the project managers directly from the global reserve. If the commodity is non-offset credits, then the national governments may issue credits directly to producers and there is no need for an international reserve management or credit-issuing function.

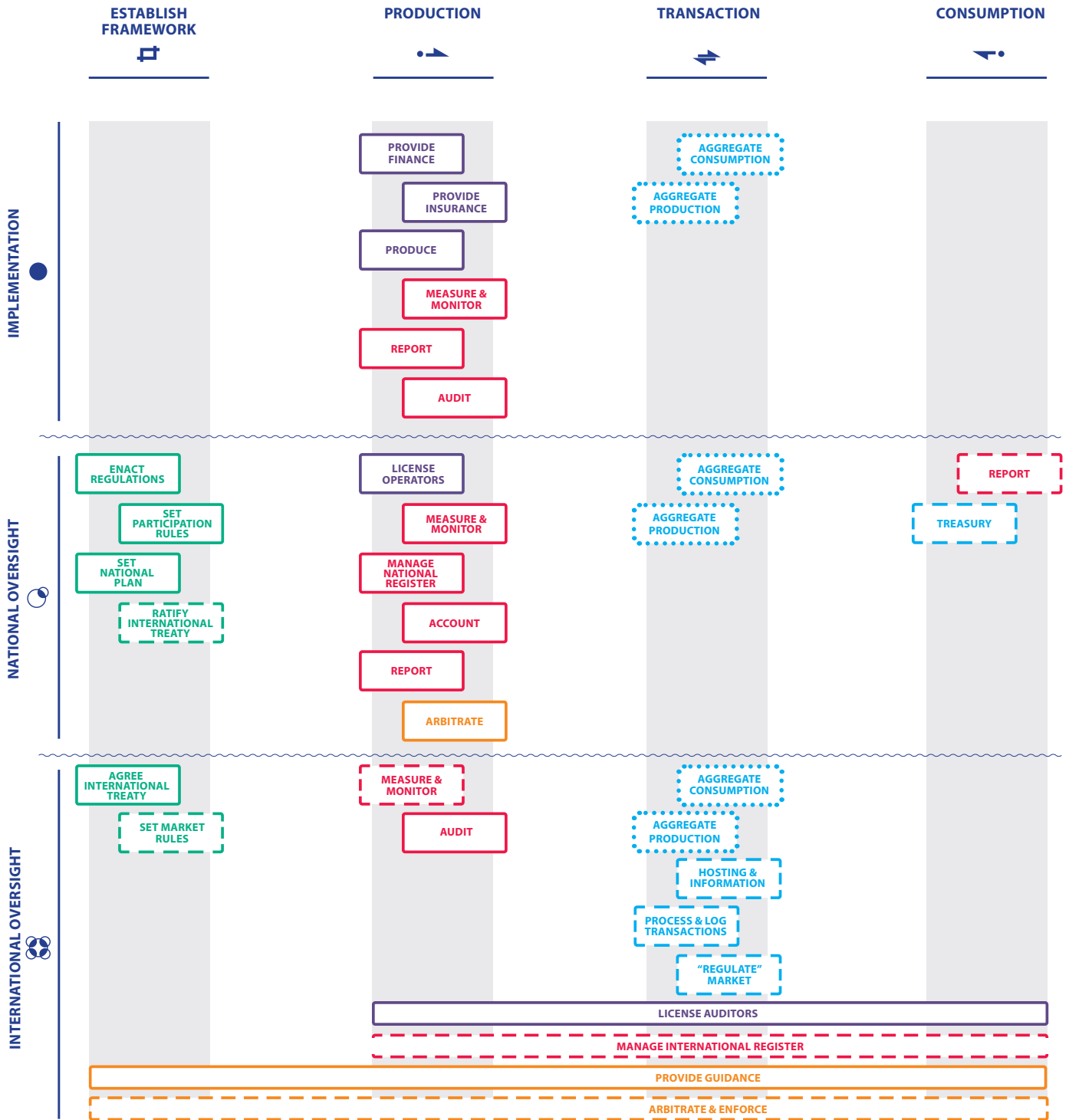
Transaction: As illustrated by Figure 1, there are several models for the interaction between producers and consumers: (i) A single (aggregated) producer can sell to a single (aggregated) consumer, (ii) multiple producers can sell to a single (aggregated) consumer, (iii) a single (aggregated) producer can sell to multiple consumers and (iv) multiple producers can sell to multiple consumers. Products and payments may therefore be aggregated on the "Production" and / or "Consumption" side by private or public entities at the sub-national, national or international level. An aggregator could also act as a buffer or intermediary institution to manage the flow and price impacts of these credits onto established carbon markets. Sell side aggregators have precedents in other sectors, for example in the wheat trade (see Box 4). Where the transaction is the trade of offset credits in with a number of buyers and sellers, hosting and information services are needed (ie, a market place needs to be maintained). All transactions in this market would be processed and logged in the international registry for use by the international accounting and auditing authorities as required. There may also be a dedicated body that regulates transactions in the market (eg, maintains market stability in the face of short term price volatility).

Consumption: Demand for the product will be determined by three factors: (i) the stringency of targets to be achieved in developed countries (ie, leading to demand volume of mitigation), (ii) the extent to which these targets may be met via the specific product (ie, REDD+ activities) as decided through international legislation or national "import" criteria, and (iii) domestic marginal abatement costs. Assessment of net GHG liability will need to be made by national governments and individual entities regardless of whether these offset credits are REDD+ related or not, and therefore, the functions needed to make these assessments are not discussed here. In terms of the purchase of the specific product (eg, REDD+ offsets) by national and sub-national entities, this information is available from the international register where all transactions have been logged,

and this can be used for appropriate national level reporting and accounting. In terms of additional, REDD+ specific functions, if any capital investment is made from, or purchases are paid for, using public sector monies, then a national treasury function is needed to manage the collation of these monies.

Figure 3:
Functions in a Flexible Incentives System

- Support & guiding functions
- Rule & target setting functions
- Generation of reduction & sequestration functions
- Certification functions
- Facilitate payment functions
- Solid line: essential under all models
- ⋯ Dashed line: required under some (model-specific)
- ⋯ Dotted line: optional under all models



2.4 A Common Functional Underpinning

As noted above, there is a need for the delivery of terrestrial carbon mitigation at scale. But there is no “one size fits all” solution in terms of how incentives can and should be delivered. However, when considered through the lens of “what needs to be done”, there is a common functional underpinning. It is notable that the majority of functions identified are “essential under all models”, particularly at the “Implementation” and “National Oversight” levels. This is important as it provides a clear path for action now, even while the exact terms of possible incentive policies remain undecided. This common functional underpinning is addressed in more detail below.

The functions map (Figure 3) presents a consolidated picture for the system across a variety of possible models. It is also insightful to consider how the need for different functions is shaped by different factor choices (for example where monies come from the public versus the private sector, where monies are distributed via a fund, or there is free access to a compliance market, where payment is for offset credits versus other policies and measures etc. see Figure 1 for all these options). This is important in order to understand both the different functional requirements across countries, and also to understand the different functional requirements over time, for example if the system starts with a fund mechanism and moves to a market-based one.

In this context, the following points are of note:

- Wherever agreement is between nation states, whether through a bilateral treaty or a UNFCCC mandated agreement, national (and sub-national) scale planning, including development plans and legislative reviews will be needed. Further, all but one of the “Implementation” and “National Oversight” functions on the “Production” side will be needed to ensure that (i) delivery of mitigation can be achieved and (ii) it can be certified to the satisfaction of the consumer. The exception is national level reporting. The extent of international oversight may vary: although not explicitly required in the case of bilateral arrangements, international measurement, monitoring and reporting may be desired for global assessment of overall climate impacts, and international guidance will likely be needed given the complexity of the problem and the need for consistency of standards.
- Wherever the principle of “payment for performance” is followed, measuring and monitoring, reporting, accounting, and auditing functions (at least at the “Implementation” and “National Oversight” levels – see above) will be needed to assess delivery against the appropriate performance measure. The key factor is the degree of assessment standards: perhaps non-offset credits and other policy measures will be subject to lower assessment standards than offset credits.

- Where monies to provide incentives are sourced from the public sector at the national level, there is a need for a national treasury function to manage the raising of this money. Where monies are sourced from the private sector any functional requirements are tied up in how this money is collated and distributed to producers (eg, through a compliance market or via a fund type mechanism), which is addressed below. Whether monies are sourced from the public or private sector makes no further impact on the question of which functions are required.
- In terms of the significance of the collation and distribution mechanisms for performance and for incentives, the key determinant is the level of devolved responsibility for participants, on both the “Production” and the “Consumption” side, to interact directly with their counterparties in the transaction. Where no authority is devolved by national governments, some degree of aggregation will be required at the national level. Even where authority is fully devolved, some aggregation type functions may voluntarily arise, in the form of co-operatives or similar. If a compliance market is utilised, then these “Production” and “Consumption” side aggregator functions are optional – producers and consumers may or may not engage directly in those markets. If a compliance market is not utilised, it is likely that aggregator functions will be utilised as a pragmatic approach to marshalling many producers / consumers. Where a compliance market is utilised, there is a need for rule setting and regulation of these markets, and hosting and transaction services. These considerations apply at both the national and international level.

2.5 Testing the Analysis

The functions map (Figure 3) presents a consolidated picture for the system across a variety of possible models. This section unpicks this map in the context of four case studies derived from existing REDD+ proposals and representing four different models of operation. This provides both an illustration of the use, and a test of, the trading concept and the functions lens, in terms of whether these case studies can be meaningfully interpreted within this framework and adequately represented by some combination of these functions.

The four case studies are described below and Table 1 summarises the functional requirements for each of them. All four case studies can be interpreted and represented in this framework.

Each model has been mapped to show its variation in respect of the four factors first presented in Figure 2.

The mapping key is as follows:

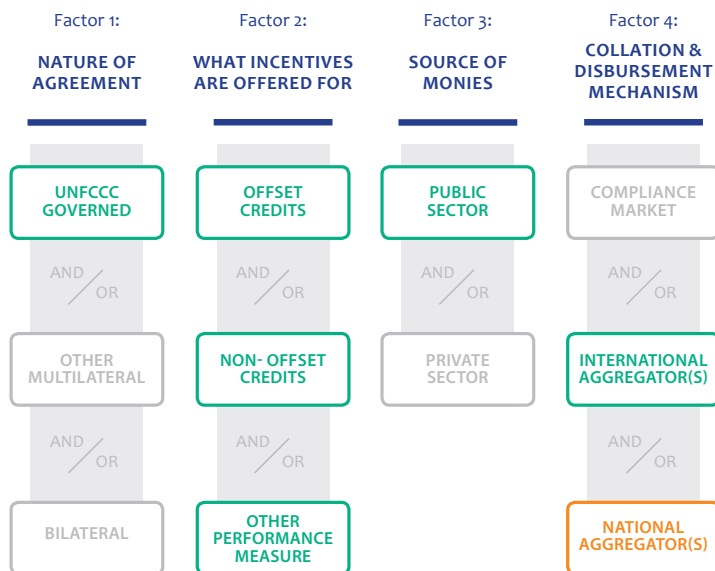
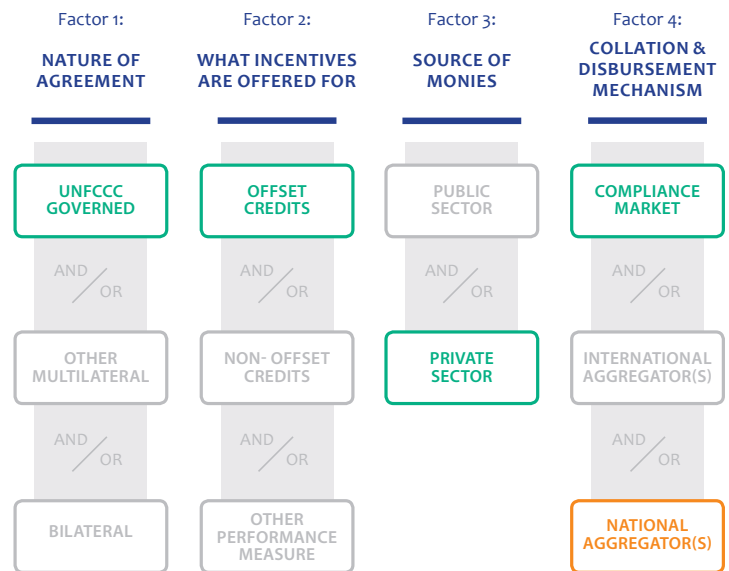
- Essential in this model
- Optional in this model
- Not utilised in this model

Case Study 1: A COP-Mandated Compliance Market

COP mandated REDD+ agreement within the current UNFCCC framework. Offset credits are traded in a compliance market (such as the EU ETS). Ultimate consumers are private sector entities in developed countries, purchasing to offset their emissions. On both the “Production” and “Consumption” side, some national governments authorize private sector entities to buy / sell directly in the market, while others employ a “single desk” policy where all transactions in the compliance market must be made by a national aggregator body.

An example of this model is Australia’s proposal, which calls for a carbon market that includes forest-carbon¹⁹.

19. Australia’s submission to the UNFCCC: “Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, Submission to AWG-LCA, AWG-KP and SBSTA” (23 March 2009). Available from: <http://unfccc.int/resource/docs/2009/awglca5/eng/misc01a02.pdf>



Case Study 2: A COP-Mandated International Fund

COP mandated REDD+ agreement within the current UNFCCC framework. Public sector monies are routed through an international fund. This fund could be dedicated to REDD+ or to broader climate change mitigation finance. For example, per the operation of the Least Developed Countries Fund²⁰, finance could be raised from public funds from developed countries and routed through the Global Environment Facility (GEF). Payments could be routed directly to national institutions in the selling country. Payment could be for a variety of measures of performance, depending on country circumstance, up to and including offset credits for use in offsetting national domestic emissions targets.

An example of this model is the “COP-Mandated Fund Model” discussed in Meridian’s ‘REDD+ Institutions Options Assessment’²¹.

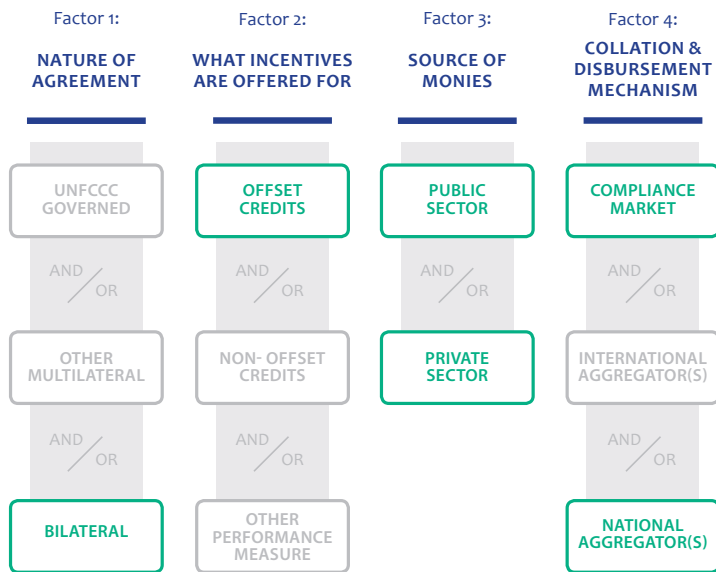
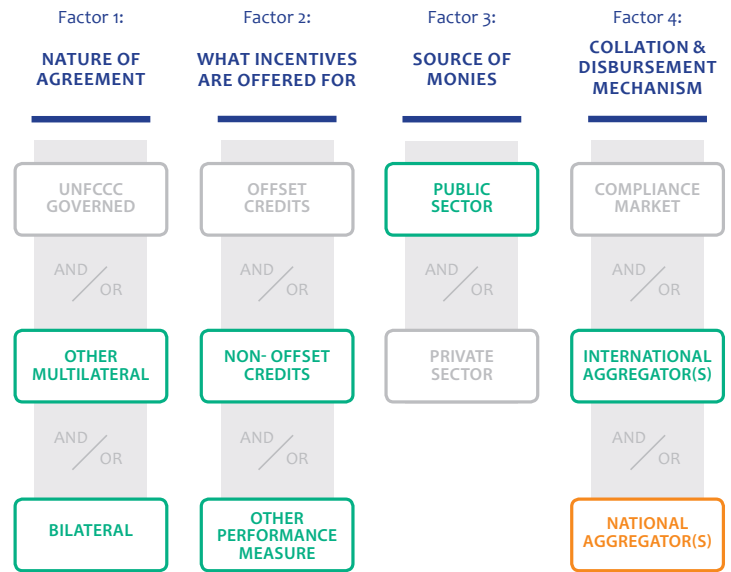
20. For information see: http://unfccc.int/national_reports/napa/items/2719.php

21. REDD+ Institutional Options Assessment: Developing an Efficient, Effective, and Equitable Institutional Framework for REDD+ under the UNFCCC, by Streck, Gomez-Echeverri, Gutman, Loisel, Werksman. Available at www.REDD-OAR.org

Case Study 3: A Network of Multilateral Funds

A number of funds exist, and oversight and co-ordination is required to co-ordinate collation and disbursement of finance and possibly credits between participants. This is similar to Case Study 2, except that neither the agreement nor the fund(s) are mandated by the COP, and payments are for a variety of performance measures, and possibly non-offset credits, but not for offset credits. An example of this is Project Catalyst's suggestion of a series of bilateral trust funds, supported by National Climate Trust Funds to manage distribution in producing countries²².

22. *Scaling up Climate Finance*, McKinsey & Co, 2009, available at <http://www.project-catalyst.info/>



Case Study 4: A Bilateral Arrangement for Trade of Credits in a (New) Compliance Market

An example of this is one segment of the model embodied by the American Clean Energy and Security Act 2009²³. Under the provisions which provide support to national governments to reduce emissions from deforestation, a bilateral agreement is made between the US and the counterparty government for the direct purchase of compliance credits. These credits may be held in a reserve or sold to public and private entities in the US via a new US market for offset purposes to meet imposed caps. Finance is therefore sourced from a mix of public sector and private sector sources (including allowance auction revenues).

23. This is also called the Waxman-Markey Bill. For information on the "American Clean Energy and Security Act of 2009 see <http://www.govtrack.us/congress/bill.xpd?bill=h111-2454>

Table 1:
Comparison of case studies

 Essential in this model

 Optional in this model

 Not utilised in this model

	CASE STUDY 1	CASE STUDY 2	CASE STUDY 3	CASE STUDY 4
	COP MANDATED MARKET	COP MANDATE FUND	NETWORK OF MULTILATERAL FUNDS	BILATERAL DEAL, MARKET
OVERARCHING				
INTERNATIONAL OVERSIGHT				
1	Provide guidance			
2	Arbitrate and enforce			
3	Manage international register			
4	License auditors			
ESTABLISHING FRAMEWORK				
INTERNATIONAL OVERSIGHT				
5	Agree international treaty			
6	Set market rules			
NATIONAL OVERSIGHT				
7	Ratify international treaty			
8	Set national plan			
9	Set participation rules			
10	Enact regulations			
PRODUCTION				
IMPLEMENTATION				
11	Provide finance			
12	Provide insurance			
13	Produce			
14	Measure and monitor			
15	Report			
16	Audit			
NATIONAL OVERSIGHT				
17	License operators			
18	Arbitrate			
19	Measure & monitor			
20	Account			
21	Manage national register			
22	Report			
INTERNATIONAL OVERSIGHT				
23	Audit			
24	Measure & monitor			
TRANSACTION				
25	Aggregate production			
26	Hosting and information			
27	Process and log transactions			
28	Regulate market			
29	Aggregate consumption			
CONSUMPTION				
NATIONAL OVERSIGHT				
30	Treasury			
31	Report			

3. Building the System

This section describes the sequencing of function development in order to identify what functions need to be ready by when in order to deliver mitigation. This includes an assessment of the status of each functions' development, existing functional and institutional precedents, potential bottlenecks and priorities. Following this analysis, operationalising strategies are discussed, including how scaling-up might occur through a "phased approach" and how the "two track" approach can catalyze mitigation in the earlier phases. This section concludes with a general description of how incentive systems for REDD+ might be evolved over time to accommodate full terrestrial GHG accounting.

3.1 Sequencing of functions and assignment of responsibility

The spread on the following pages (Figure 4) illustrates the sequence of when functions need to be ready, existing precedents for the function, the likely type of end state institution with responsibility for the function and an example of a precedent for such an end state institution. The colour coding describes the status of implementation of each function.

What this figure does not describe is the actual time required to make each function operational, which is dependent on the specific political and technical contexts. However, while it is clear that many of the implementation and national-level functions will take several years to be ready, all are sufficiently well understood for early action and pilot activities to proceed now. Many existing organisations are already working to develop these functions in preparation for 2013 and beyond.

Figure 4 describes some key categories of institutions. In this report, we make the following broad distinctions between types of institutions:

- International Executive Bodies (IEB): Institutions that are overseen by an international supervisory body (eg, the UNFCCC).
- International Appointed Bodies (IAB): Institutions that can operate free from oversight by a supervisory body (an example of this would be the IPCC which provides information to, but is not governed by, the UNFCCC).
- Government (Gov): Existing national-level government department.
- Designated National Bodies (DNBs): Private or public institutions, including sub-national public entities, that have been appointed by a national government to take on a function in a country.
- Independent Private or Public Organisations (IPPOs): All other institutions which are neither appointed nor directly overseen by international or national bodies. This includes multilateral organisations (eg, World Bank, FAO), development agencies (eg, NORAD, USAID), NGOs (eg, WWF, Conservation International) and private companies (eg, banks, private investment vehicles).

3.1.1 Bottlenecks to sequencing

Based on Figure 4, there are two primary bottleneck functions at the international level. The first is to "Agree the international treaty" or indeed any bilateral or other agreement exchanging economic incentives for increased mitigation from the AFOLU sector. This is important as the ratification of such a treaty in country can be a slow process, depending on national legislative requirements. Although national governments can and are setting national plans and regulations in advance of firm international agreements, this must be backed up by real international commitment in order to provide sufficient confidence to stakeholders that it is worthwhile investing their resources in taking on the various dependent functions. This is because enactment of "National Oversight" and "Implementation" functions often requires significant resources²⁴, including the development of national measurement and monitoring capacity²⁵. Governments and other institutions have many competing capital requirements must be provided with a signal that investments in building out the essential functions will be rewarded by incentives through an international agreement.

The second is the treasury function. While not explicit in Figure 4, most of the funds required for the establishment of national-oversight functions will be from public sources. The treasury function is therefore required to collate public funds to be spent on establishing the system initially, under some models it may also be used as a source of payment for incentives at scale. It is therefore necessary to secure this funding quickly so that it can be spent on building out the functions. It will also potentially signal the size of incentives to producers if public monies are expected to be the source of future incentive payments. This function is also likely to be developed at the same time as the international agreement eg, a bilateral deal where money is set aside by the consuming country or a multilateral deal where several consuming countries contribute funds to purchase products through a central treasury or fund.

In addition, key bottleneck functions at the national level are the delivery of national development plans, legislative review and rule setting for participatory mechanisms (again as this is key to providing confidence in a secure foundation in country) and clarity on the roles and incentives for each stakeholder group²⁶.

24. The Eliasch Review estimated up-front capacity building costs of up to \$4 billion over five years for a total of 40 forest nations. From 'The Eliasch Review: Climate Change, Financing Global Forests' (October 2008) www.occ.gov.uk

25. For example, see UNFCCC, "Cost of implementing methodologies and monitoring systems relating to estimates of emissions from deforestation and forest degradation, the assessment of carbon stocks and greenhouse gas emissions from changes in forest cover, and the enhancement of forest carbon stocks." Technical Paper FCCC/TP/2009/1. 31 May 2009 and LTS International (2008). "Capability and cost assessment of the major forest nations to measure and monitor their forest carbon, for Office of Climate Change." UK.

26. Please refer to Terrestrial Carbon Group, Policy Brief 4: "Legal and Institutional Foundations for the National Implementation of REDD" available at: <http://www.terrestrialcarbon.org/Publications.aspx>

Figure 4:

When functions need to be ready and precedents

● *Capability exists at required scale* ● *Capability exists but needs to scale*

● *Capability does not exist but precedent exists*

● *Continuation of this function is required*

	RULE SETTING										OPERATION										PRECEDENT FOR FUNCTION	END STATE ORGANISATION	PRECEDENT FOR END STATE ORGANISATION													
	INTERNATIONAL OVERSIGHT					NATIONAL OVERSIGHT					INTERNATIONAL OVERSIGHT					NATIONAL OVERSIGHT																				
OVERARCHING																																				
INTERNATIONAL OVERSIGHT																																				
1	Provide guidance	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Assessment reports on Climate Change, support and guidance for readiness	IAB	IPCC, UN-REDD programme, FCPF			
2	Arbitrate and enforce	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Compliance Committee of the Kyoto Protocol	IEB	UNFCCC CDM Registry		
3	Manage international register	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	UNFCCC CDM Accreditation team	IAB			
4	License auditors	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
ESTABLISHING FRAMEWORK																																				
INTERNATIONAL OVERSIGHT																																				
5	Agree international treaty	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Agreement of the Kyoto Protocol	IEB	COP	
6	Set market rules	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	EU decision on regional trading rules for Trading Scheme	IEB / GOV	Regional and national governments	
NATIONAL OVERSIGHT																																				
7	Ratify international treaty	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Ratification of the Kyoto Protocol	GOV	National government
8	Set national plan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Development of national plans	GOV	National government
9	Set participation rules	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	National laws governing who can do what business in the country, and operating requirements	GOV / IAB	National government bodies reviewing and granting business operating licenses
10	Enact regulations	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Enactment of trade rules	GOV	National government	
PRODUCTION																																				
IMPLEMENTATION																																				
11	Provide finance	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Traditional private and public finance provision, loan financing from development banks	IAB, DNB, JPP O	Banks, development agencies, national government funding agencies (grants / loans), development banks such as IBRD and IDA, FIP
12	Provide insurance	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Insurance provision for extreme weather risks, political risks	IAB, DNB, JPP O	Multilateral Investment Guarantee Agencies (MIGA), state-sponsored insurance, private insurance companies
13	Produce	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Development of A/R projects under the CDM	DNB, JPP O	Private project developers of CDM projects (see Box 5 below)
14	Measure and monitor	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Measurement and monitoring of project activities by developer	DNB, JPP O	Private project developers eg, TerraGlobal, Green Resources
15	Report	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Reporting of CDM project status to the UNFCCC	DNB, JPP O	Developers reporting project performance
16	Audit	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Verification and validation of CDM projects	DNB, JPP O	Private auditors (eg, DNV), Government authorities auditing company accounts
NATIONAL OVERSIGHT																																				
17	License operators	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Granting of "build own, operate" licenses to power plants	DNB	Government appointed Energy Commission
18	Arbitrate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Arbitrate natural resources disputes (eg, ownership to reserves)	DNB, IAB	US National Arbitration Forum	
19	Measure & monitor	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	National Forest Inventories	DNB	Government department carrying out national forest inventory, eg, FONAFIFO, INPE
20	Account	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	National account (GHG inventories) compiled by Annex I countries under UNFCCC	Gov, DNB	Annex I Government ministries producing GHG accounts (inventories)
21	Manage national register	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	National register of covered entities under the EU ETS	DNB, IEB	Management of European covered entities by the Commission
22	Report	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	National reports (communications) submitted by signatories to the Kyoto Protocol	Gov	Reports submitted by signatories and submitted by Governments to the UNFCCC
INTERNATIONAL OVERSIGHT																																				
23	Audit	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Audit of national GHG inventories submitted by Annex I countries	IAB, JPP O	Joint Implementation Supervisory Committee (JISC)
24	Measure & monitor	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Global assessment reports on climate change trends	IAB	IPCC, Global Terrestrial Observing System (GTOS), NASA, Earth Observatory
TRANSACTION																																				
25	Aggregate production	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Wheat boards, Amazon Fund (Brazil), National Forestry Financing Fund (Costa Rica), voluntary co-operatives, commercial agricultural aggregators	DNB, JPP O	Brazilian Development Bank (BNDES), Costa Rica's FONAFIFA, GEF
26	Hosting and information	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Exchanges for buying and selling carbon credits that provide up to date price information	DNB, JPP O	European Climate Exchange, New York Stock Exchange
27	Process and log transactions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	International log of carbon credit transactions (eg, ITI)	IAB	Administrators of the UNFCCC International Transaction Log (ITL)
28	Regulate market	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Maintenance of price stability within financial markets	IAB	European Central Bank
29	Aggregate consumption	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Multilateral organisations aggregating demand from Annex I governments	DNB, JPP O	World Bank, Spanish Carbon Fund
CONSUMPTION																																				
NATIONAL OVERSIGHT																																				
30	Treasury	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Government funds set aside to purchase carbon credits	Gov/DNB	Government treasury
31	Report	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	National reports and account compiled by Annex I countries under UNFCCC	Gov	Relevant Government ministries collaborating to produce national reports

3.1.2 Institutions with Responsibility for the Functions

Figure 4 also describes the type of institutions which could take on responsibility for the function in a fully-fledged payment-for-performance incentive system operating at scale, and also existing examples and precedents from the carbon market and from other sectors.

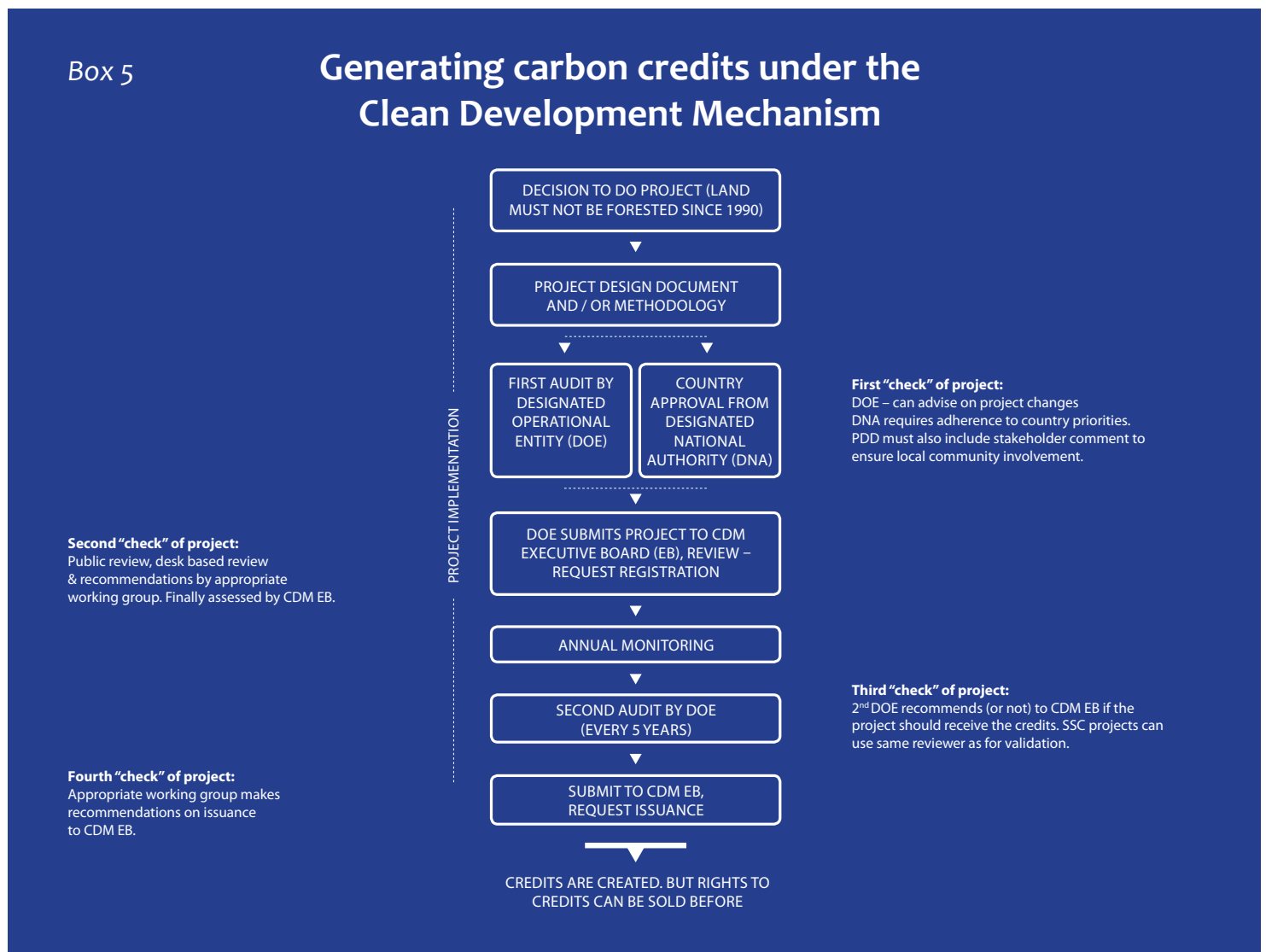
A key insight from the Informal Working Group on Interim Finance for REDD+ is that the current institutional architecture for REDD+ is mainly designed to facilitate technical administrative support on a relatively small scale for capacity building, policy reforms and to a certain extent investments. The capability for a multilateral institutional basis for running a results based incentive structure will need to be strengthened and scaled up²⁷.

However, it is notable that a number of appropriate institutions already exist, and useful lessons and templates may be drawn from outside of REDD+ to enhance or supplement new and fledgling REDD+ initiatives and institutions.

For example, a number of functional and institutional precedents exist in the CDM mechanism, including maintaining an international registry and licensing auditors, and providing arbitration (see Box 5 for a description of the process and the institutions responsible for generating carbon credits under the CDM). Also, lessons can be shared from the reporting process whereby Annex I government ministries are required to submit GHG reports to the UNFCCC, and also from the national forest inventory services carried out by INPE in Brazil for example.

It is important to utilise these other experiences and institutions in a full assessment of institutional capability and design, resulting in the allocation of clear mandates as appropriate.

27. Report of the Informal Working Group on Interim Finance for REDD+, October 27 2009, Discussion Document



3.1.3 Enabling Mitigation: Priority Institutions

Referring only to the list of functions can lead to an overestimation of the number of new institutions required. A separate institution is not required for each function; some institutions can take on an expanded mandate and fulfil a number of functions. Further, a number of suitable institutions already exist.

Priority institutions for the system build out are those that are essential under the specific model utilised by the country, and are therefore likely to be “National Oversight” functions. Most of the “International Oversight” functions will evolve in line with the international agreement and many of the “Implementation” functions will evolve as national rules are set.

In addition, all of the “National Oversight” functions are categorised as “Capability does not exist but precedent exists”²⁸. These priority institutions might be combined into the following two national-level public and / or privately managed institutions:

- A government-appointed body (eg, DNB) to license and arbitrate between operators, using input received from a set of qualified, independent auditors.
- A Government body responsible for national measurement and monitoring, maintaining a registry of project and national level activities within the country and preparing the national carbon accounts.

3.2 Scaling Up from Early Action to Full Implementation

Figure 4 illustrates the sequential flow to commoditize terrestrial carbon, including some of the most important precedents and institutional capacities. It does not illustrate the timing and steps required to implement each function.

Early action is critical because the “National Oversight” and “Implementation” functions on the “Production” side will take time to develop and scale up. For example, although necessary measurement and monitoring protocols exist, many developing countries do not currently have the funds or capacity to implement these. Also, a number of countries do not currently have the necessary legal and regulatory capacity to monitor and enforce activities, nor the institutional frameworks in country to oversee and co-ordinate implementation.

These issues can be mitigated by utilising a phased approach along, or in combination with, a two-track process. These strategies are described in the sections below.

Although this build out may seem a daunting task, an example from the growth of Indian commodity markets (Box 6) following a multi-decade ban on the use of commodity derivatives show that notable scale can be achieved in a relatively short period of time.

Box 6

Indian commodity market: An example of building a system

Concerned about the impact of speculation on farmers, the Government of India initially banned options in cotton in 1939. It subsequently banned forward trading in oilseeds, food grains, spices, vegetable oils, sugar and cloth in 1943. All options and forward trades were banned, except from on certain heavily-regulated Government exchanges, after independence by the 1952 Forward Contracts (Regulation) Act. Bans on these activities were increased even further during the 1960s as severe drought caused many farmers to default on forward contracts. An option is a financial instrument giving its holder a right but not an obligation to buy (or sell) a specified quantity of a commodity at a set price and by a certain deadline. Forward trading, using a futures contract, is an agreement to buy or sell a commodity for a pre-agreed price at a specific time.

The liberalization of the Indian economy during the 1990s caused the Government to review the role of derivatives for a well-functioning market. In 1993, a Government appointed committee recommended allowing futures trading in 17 commodity groups, strengthening the Forward Markets Commission (FMC) and registration of brokers with the FMC by amending the Forward Contracts (Regulation) Act of 1952. Commodities options trading remains banned.

The FMC imposed a suite of regulations to help ensure that quality exchanges were established, eg, daily mark to market system of margins, creation of trade guarantee fund, back-office computerization, online

trading and one third representations of independent directors on the boards of exchanges. In response to these changes, several national multi-commodity exchanges were set up in 2002. These were initially only allowed to trade in 8 commodities – this was increased to 80 commodities in mid 2004. The value of trades grew from 350 billion Indian Rupees in 2001-02 to 1.3 trillion in 2003-04.

This case study is relevant to the current discussion on scaling up the carbon market (eg, sectoral crediting) and to REDD+ as it is an example of how changes in policy can unleash significant monies. Two caveats which make this example less relevant are that India had previously had a market in these derivatives, and that this example deals with derivative products rather than the physical commodity.

References: <http://www.eurojournals.com/IRJFE%202%2011%20Ahuja.pdf> and Forward Markets Commission (Ministry of Consumer Affairs, Food and Public Distribution): <http://www.fmc.gov.in/>

It is imperative that the system and functions that are developed now have “upward compatibility” so that (i) those built for bilateral or similar deals can in future be used within the constructs of a future international agreement, (ii) those built in different countries give rise to comparable impacts (specifically comparable measurement and monitoring methods and quality assurance / quality control (QA / QC) procedures), and (iii) they are flexible enough to incorporate greater land areas and additional land classes over time as broader scope incentive systems are agreed.

Phased Approach

The phased approach proposed by many parties²⁹ encompasses three broad phases: Phase 1: Readiness (planning and initial capacity building), Phase 2: Early Action (continued capacity building and pilot projects), and Phase 3: Full implementation³⁰.

Each phase is typically characterised by differences in the sources of monies, the distribution mechanism, and the performance being paid for. An example of how the performance might be paid for changes is that incentives might initially be offered for policies and measures and move towards payment for CO₂e mitigation (eg, CERs). Sources of money may shift from the public finance sources currently utilised (see Box 1) and any interim financing mechanisms³¹ through to public and private sources via a market-based mechanisms as methods to ensure certainty around the unit of the product are refined (eg, an activity on a certain type of land results in a certain tons per carbon per hectare).

Different countries will move through these phases at different speeds, but the system should incentivise movement towards Phase 3 as early as possible.

During the different phases, both the activities involved in carrying out the functions and the institutions responsible for them are likely to evolve, but the essence of each function will remain the same. Most of the functions, and responsibility for carrying out the function, can be initiated in the current “Readiness” phase. Institutions responsible for the international register, for auditing, accounting and “Implementation” level arbitration functions are not needed until Phase 2 (Early Action).

Figure 5a and 5b indicate the factors and the functions believed to be needed for the operation of Brazil’s early action through the Amazon Fund referred to in Box 1. Over time, these factors and functions could change into those identified in any of the models described in Section 2.2.1.

Two-Track Approach

Another approach to facilitate participation at scale is the provision of institutional capacity and support at an international level on an interim basis for those countries that do not yet have the necessary capacities in country. The approach is used by the current JI mechanism under the Kyoto Protocol (see Box 7) in order to incentivise and accredit activities in the absence of a strong national oversight body.

The benefit of this approach is that it allows developers to obtain incentives in exchange for proven results, even when activities are carried out in countries that do not have a complete national infrastructure in place. The essential functions and institutions in this framework are independent auditors (licensed by the international oversight body) and international registers and accounting. A key consideration is the extent to which national accounting is desired and undertaken (whether directly by national bodies or indirectly on their behalf by international bodies), and how supporting early production can be reconciled with and transitioned to full national accounting.

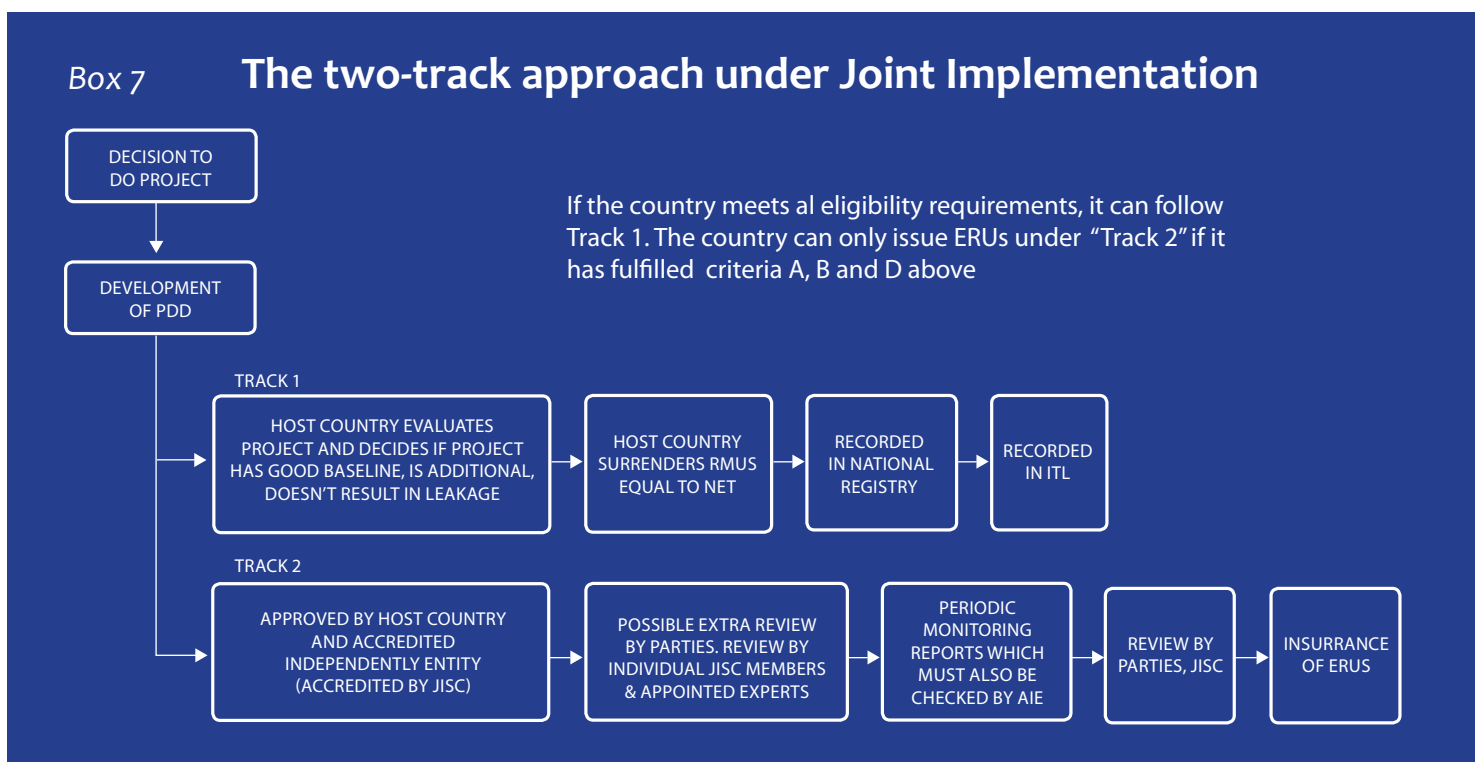


Figure 5a:
Interpretation of the functions believed to underpin early action in Brazil:
Factors in the transitional arrangements

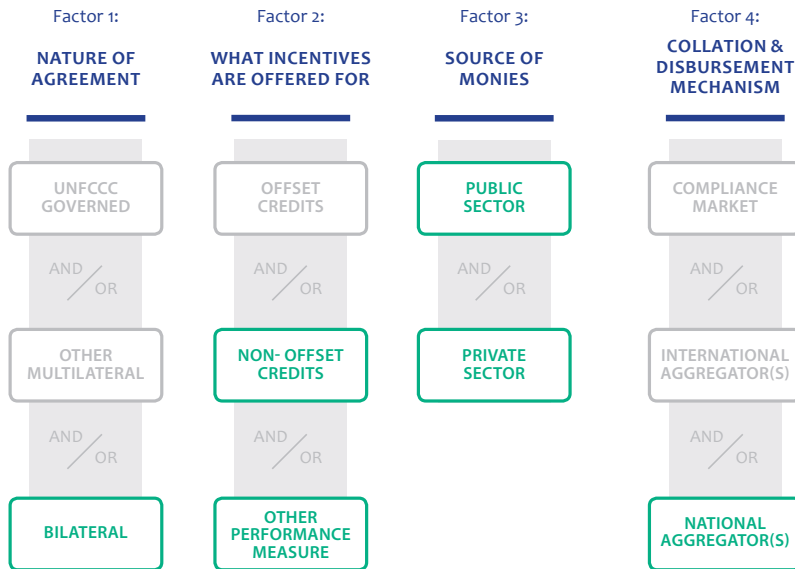


Figure 5b:
Interpretation of the functions believed to underpin early action in Brazil:
Functions map for the transitional state

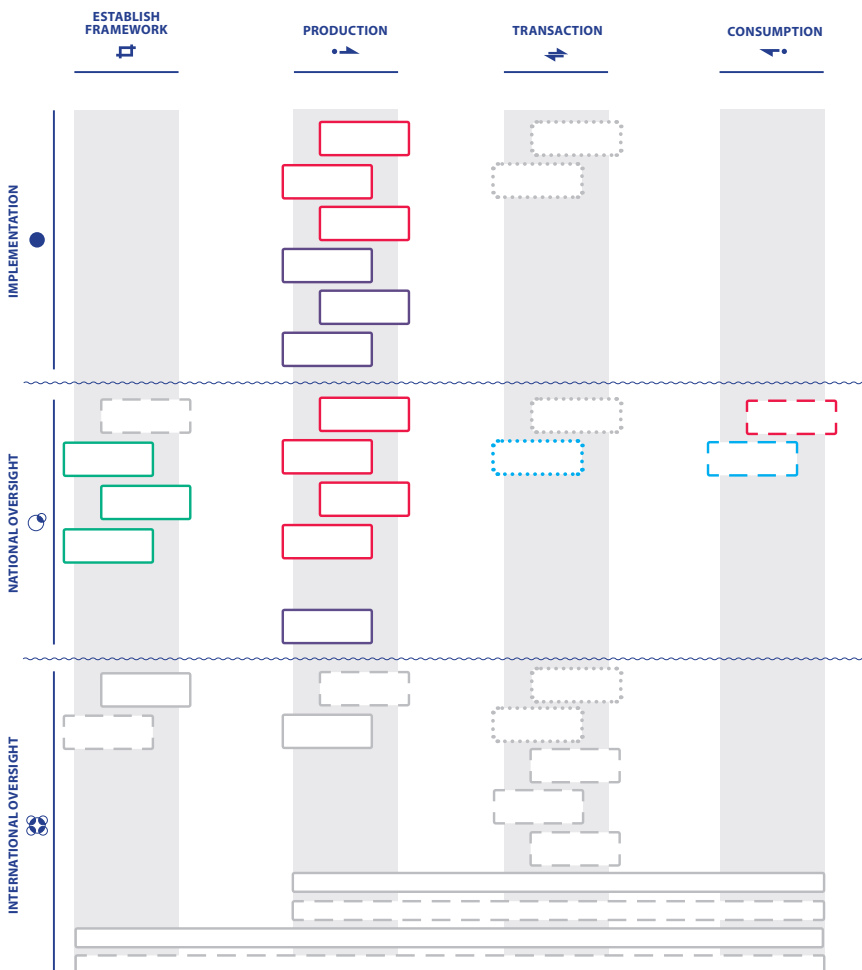


Figure 5b: Boxes with coloured lines indicate functions utilised during the transitional state. Boxes that are grey are not utilised. For the full text version, please refer to Figure 3.

28. The capacity for the "Measure and monitor" function (for forests) at the national-oversight level exists in some countries (eg, Brazil), but not in others.
29. Proponents include the Coalition for Rainforest Nations and the Government of Norway
30. See REDD+ Institutional Options Assessment: Developing an Efficient, Effective, and Equitable Institutional Framework for REDD+ under the UNFCCC, by Streck, Gomez-Echeverri, Gutman, Loisel, Werksman. Available at www.REDD-OAR.org
31. For more information on interim financing see 'Report of the Informal Working Group on Interim Finance for REDD+ (IWG-IFR)', October 27, 2009, Discussion Document, and 'An Emergency Package for Tropical Rainforest', The Prince's Rainforest Project, March 2009

3.3 Expanding the Scope over Time from REDD+ to AFOLU

In terms of upward compatibility as the system expands in scope over time³², many of the functions necessary in a REDD+ (ie, forest) system are also necessary in a system which incentivises terrestrial carbon mitigation in the other land use classes³³. Functionally and institutionally, it should therefore be easier to implement full terrestrial carbon accounting once REDD+ is fully operational, assuming additional incentives and capacities are available.

However there are particular challenges associated with adding each additional land use class to the international agreement, and specifically, to ensuring that there is assessment compatibility between the forest class and other land use classes. Assessment compatibility is required in order to ascertain what the global terrestrial liability or asset is for the sum of all land use classes.

The general issues that must be addressed before incorporating an additional land use class into the system can be categorised into³³:

- Measuring and monitoring capability
- Implementation activities: ability to carry out on-the-ground activities
- Finance and risk management
- Accounting
- Basis of the incentive system (including what the production unit is, and how it is different from that related to the forest sector).

In all categories, the ability to deal with greater volumes of production must be considered.

As an example, specific issues with adding the cropland land use class to the agreement are described in Table 2.

The addition of non-forest land use classes in the incentives scheme will be dependent on the specific national circumstance, such as mix of land uses, knowledge of alternative land management practices, data availability, and financing (eg, existing national budget, available support and potential profit). Similar to REDD+, it is envisaged that a phased approach will be necessary, and that different countries or regions may choose different types of agreements, incentives, sources of money and type of interface depending on the specific land use type to be included and the technical and political capacity. In essence this process is likely to follow much the same broad path as for REDD+ (see Figure 4).

The decision on which land use classes to include first should be taken at the international level (ie, by parties to the multilateral or bilateral deal), as it should be based on an assessment of how

much of an international GHG liability that sector is, eg, one example of a currently unaddressed international GHG liability is methane resulting from peatland destruction.

The first step to achieving full terrestrial GHG accounting is a clear signal at Copenhagen on the timeline for this assessment and expansion.

31. Specifically, the end goal of an international incentive system that addresses sustainable management of all types of lands must be considered when building the capacity, institutions and incentive structures for the chosen REDD+ model as it is the foundation for an eventual global system encompassing all land use classes.

32. The six IPCC land use categories are: Forest, Cropland, Grassland, Wetland, Settlements and Other Land. Please refer to the IPCC: www.ipcc.ch

33. For more information on specific issues with measurement and monitoring and on ability to carry out on-the-ground activities please refer to: Terrestrial Carbon Group Policy Brief 5: "Measuring and Monitoring Terrestrial Carbon as part of REDD+ MRV Systems" available at: <http://www.terrestrialcarbon.org/default.aspx> and Terrestrial Carbon Group: "Research Needs for AFOLU" (forthcoming)

34. They may even be very different for the various project types within REDD+. For example, it is likely that RED activities will have much quicker returns than A / R activities as there is not a wait before the trees reach maturity to gain credits.

Table 2
*Specific considerations for including cropland activities
into an international agreement*

Category of issue	Specific considerations: Crop lands
Measuring and monitoring capability	The majority of mitigation potential in this land use class is related to soils (including applications to soils). This uses a very different measurement and monitoring approach to the biomass pools which tend to be the primary focus of forests. Consequentially, how information is collected, and the timing of when it is collected are different than for forests and must be considered by measurement and monitoring agents at the various levels.
Implementation activities: ability to carry out on-the-ground activities	Not all mitigation activities in this land use class have been well-tested in all locations, and some remain controversial (eg, Biochar). There may also be different land tenure arrangements or legislation relevant to agricultural producers which may influence their interest and ability to carry out mitigation activities. For example, agricultural entities may own the rights to the crop but to the soil, thereby making it difficult to ascertain to whom soil-related carbon credits belong.
Finance and risk management	Start-up and on-going costs, eg, the investment profiles are very different for agriculture and forestry ³⁴ , indeed they may even be very different depending on the type of agriculture. Additionally issues like debt availability and typical project size and investment returns are also factors to be considered. Crop lands also tend to produce revenues once at least once a year, whereas most forestry operations must wait longer to see a return. The primary revenues (ie, the crops) are also more likely to be affected by adverse weather – but, unlike the traditional forestry industry, a wider range of insurance products exist.
Accounting	This addresses the question of how changes in this sector are accounted for in order to set and determine changes against reference levels. Of particular concern in adding this land use class is how to reconcile sub-national and national level information with that of emissions and mitigations from other land use classes and sectors (eg, emissions from livestock), to get a realistic assessment of the net national and international GHG balance without double counting.
Basis of the incentive system	This refers to the unit of production; eg, if a unit of mitigation from crop land activities is the same as a unit of mitigation from the forestry sector. If it is the same, then the incentive system must be created in such a way as to make them comparable and that a suitable supply and demand balance must be maintained for the system to handle increased volume of inflow without negatively impacting overall demand. If the units are not the same, then a separate but additional source of demand and rules for how to transact the new units must be created.

4. Assessment

A common interpretation of success is an incentive system that is environmentally effective (ie, it delivers real carbon emission reduction and sequestration, at scale, and over the long run), economically efficient and equitable.

In this context, we assess the underlying configurations of functions of the incentive system, as laid out in Figure 3 in terms of their ability to support the objectives of environmental effectiveness and economic efficiency.

Although assessment on the basis of equity falls outside the scope of this report, we believe that a system that meets the other characteristics assessed below will go a long way to ensuring equity.

4.1 Environmentally Effective

4.1.1 Generates Real Emissions Reductions and Sequestration

In order to ensure that the outputs are real, the functions in the system incorporate measuring and monitoring, reporting and auditing requirements at the “Implementation”, “National Oversight” and “International Oversight” level. This degree of cross checking, where “Production” activities and nationally reported figures are audited, enables more accurate assessment of the validity of any individual claim, and it identifies any spatial leakage (whether at the national or international level).

Coupled with rigorous accounting functions, which include buffers and reserves at both the national and international level, this configuration of functions also addresses any concerns over inter-temporal leakage, enabling resilience and stability in the face of severe shocks such as extensive forest fires or other national disasters. Critical to this risk management process are recognized and utilised guidance body(ies) which provide rigorous, harmonized standards to govern this process.

4.1.2 Delivers at Scale

Two key elements to delivery at scale are that all countries participate at scale as soon as possible, and all terrestrial carbon is included. This requires starting now with what is immediately possible, while ensuring upward compatibility for later expansion.

To incentivise all countries to participate, the map of functions described is flexible to a mix of complementary models and approaches. As shown in Section 2, it is flexible enough to encompass bilateral deals, multi-lateral arrangements, UNFCCC governed agreements, market and non-market based approaches. Crucially, the majority of the functions are largely unchanged under these varying models.

To enable all countries to participate and get up to speed as quickly as possible, the phased approach now advocated by many parties can be utilised. This allows planning and early action to start as soon as possible, with interim incentives

in place to support this, and the “carrot” of greater future incentives when the country moves to full implementation. Further, a “two track process” can be adopted whereby nations can tap into and utilise internationally provided institutions and services for an interim period while national capabilities are developed, if they so wish.

At the “Implementation” level, the configuration of functions described recognizes that action is needed to enable all producers (particularly, though not exclusively in the private sector), to enact “Production” activities at scale. This includes the provision of financing and insurance, particularly for the management of risks inherent in and specific to this sector (such as high political risk).

Lastly, recognizing the need for all terrestrial carbon to be included, a preliminary assessment of the system described indicates that it is entirely expandable and adaptable to the later inclusion of other land uses (and gases) as future knowledge, technologies and capacities allow (see Section 3.3).

4.1.3 Sustainable over the Long Run

The long run vision of the system provides rewards in exchange for results (eg, payment for offset credits). Underpinning this is a strong international treaty which sends a clear signal by including deep emission reduction targets from the developed countries to create the sustained demand for the product. For example, lack of demand is one of the reasons that the existing incentive scheme for afforestation and reforestation has not been successful (see Box 3). This is irrespective of the approach and source of monies, ie, whether via a compliance market transaction or an alternative bi- or multilateral non-offset arrangement, all of which the system described allows for (see Section 2).

In addition, any system will only be sustainable if its participants have confidence in it and ownership of it. One key element of this is clear legal frameworks, at the international and national level. In particular, a clear and comprehensive international agreement ratified by nation states, plus national laws and regulations which establish the rights to buy and sell the product and the rules and procedures for doing so. In addition, there is a need for clarity of the rules and procedures (including possible reform) over any market structures utilised.

Also important is governance and oversight at the international level. The system described envisages international oversight in respect of the auditing / verification of the emission reduction / sequestration and the maintenance of appropriate reserves and buffers. Underpinning this is an arbitration-forum for participants at the international level, with enforcement capabilities as needed.

It is not prescribed how the system should be enacted within each country. This is at the discretion of each country according to national circumstance. However, in respect of interactions between national arrangements and the international architecture, development plans and reference levels need to be reported to the international community (or alternatively

partner countries in the case of bilateral or multilateral arrangements) for review and acceptance as is consistent with a voluntary payment-for-performance arrangement between two parties.

Underpinning all of this is the need for extensive stakeholder consultation and engagement, the setting of clear mandates and an emphasis on accountability and transparency.

4.2 Economically Efficient

The system is more likely to be economically efficient if it pays only for action that would not have happened otherwise (ie, that it is additional). However, this is inherently embedded in the rules set at the international and national level, rather than the configuration of functions (eg, the rules according to which rewardable mitigation is calculated, such as reference emission levels and any supplementary conditions such as carbon budgets³⁵, glide paths³⁶, and forest plans³⁷).

More specifically, the configuration of functions described supports economic efficiency by:

- Supporting an end state where payment is tied to a certified product (eg, certified emissions reductions / sequestration), though recognizing interim measures of alternative payment for performance (such as interim finance to support and reward planning and early action)
- Utilizing all funding sources to enable a (swift) transition to the end state, and to support that end state
- Allowing for aggregation in the distribution mechanism (on the buy and / or sell side) to achieve economies of scale, to enable alternative distribution methodologies, and potentially to enable alternative trading strategies (such as reverse auctions)

35. See Terrestrial Carbon Group, Policy Brief 2: "Tools for Setting Reference Emission Levels" available from: <http://www.terrestrialcarbon.org/Publications/PolicyBriefs.aspx>

36. United States submission to the UNFCCC: "Views on how to address outstanding methodological issues related to reducing emissions from deforestation in developing countries"; Submission to the UNFCCC, Response to FCCC/SBSTA/2007/L.23/Add.1/Rev.1, paragraph 7a. Available from: <http://unfccc.int/resource/docs/2008/sbsta/eng/misc04.pdf>

37. Australia's submission to the UNFCCC: "Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, Submission to AWG-LCA, AWG-KP and SBSTA" (23 March 2009). Available from: <http://unfccc.int/resource/docs/2009/awglca5/eng/misc01a02.pdf>

5. Conclusions

As part of a solution to avoid dangerous climate change, we need a coherent, harmonised system to deliver climate change mitigation from terrestrial carbon management in exchange for financial incentives (ie, an incentives system for terrestrial carbon mitigation). This must start with what is immediately possible (ie, REDD+) and be scaled up to the ultimately necessary (ie, all land uses, or AFOLU) as soon as is feasible.

There is no “one size fits all” incentive system. There will potentially be many different, co-existing, models of operation. These models will vary according to nature of the international agreement, what incentives are offered for, the sources of monies, and the collation and disbursement mechanisms to deliver these incentives. Countries will choose to participate in whatever model is right for them.

A common framework can be used to interpret this incentives system, and the operational models within it. It is in many ways analogous to any commodity trading system, where goods are produced, transacted and consumed, although relevant safeguards on critical issues such as local livelihoods and biodiversity must be explicitly included.

In terms of what needs to be done to create and maintain this system, this report identifies 31 functions at the implementation, national-oversight and international-oversight levels. These can be grouped into five categories: (i) “Guidance”, (ii) “Rule Setting”, (iii) “Generation of Mitigation”, (iv) “Certification of Mitigation” and (v) “Facilitating Transactions”.

Half of these functions are essential under all models of operation, half are essential under some. That is, a clear, common functional underpinning exists across the variety of possible models. This means that regardless of the outcome of the negotiations under the UNFCCC or under multilateral and bilateral agreements and regardless of the associated detailed rules, action now to develop these functions will not be wasted.

Further, we do not need to “reinvent the wheel”. There are many precedents in the existing carbon incentive system (eg, the JI and CDM), as well as in other commodity markets. We can and should take lessons from these.

The current institutional architecture at the international level for REDD+ is arguably mainly designed to facilitate technical administrative support on a relatively small scale for capacity building, policy reforms and – to a certain extent – investments. At the national level, many developing countries are beginning to put in place the institutional framework required.

A number of institutions exist for a number of the functions needed. Useful lessons and templates to support new and fledgling REDD+ initiatives and institutions may also be drawn from outside these international and national initiatives. A detailed assessment is required of the international and national capability of existing institutions as a precursor to the mandating and resourcing existing or new institutions as appropriate.

In practice, mitigation activities will be scaled up from early action to full implementation over time as the capacity to deliver these functions is developed. Two complementary strategies to speed this transition are the “phased approach” (whereby incentives are available at each stage of the process) and the “two-track approach” (whereby countries can utilise functions provided at the international level while national capacity is being developed).

Given the long-term vision of a system that incentivises mitigation across all land use types, it is also necessary to consider the functional and institutional impacts and requirements of including non-forest land use types. As the technical capacity for measuring and monitoring mitigation activities from some of these other land uses and gases are at an earlier stage than for forests, it is likely that the phasing for non-forest land use types will lag behind forests. However, this report finds that many of the same functions – and therefore types of institutions – will be required in this wider incentives system.

Under some circumstances, it will be appropriate to roll these land uses into the functions and the system created for forests and carbon, while in others, it may not. This can only be decided after a country-based review of the technical capacity and potential mitigation activities and an understanding of the drivers that result in emissions (and mitigation).

Turning this vision of a harmonised incentives system into reality requires technical and financial support during the establishment phase, as well as credible signals that sizeable and sustainable monies will be available to reward production of terrestrial carbon mitigation units at scale. Without this, commitment of time and resources by and in developing countries will be difficult to maintain, and full implementation is unlikely to be reached.

In practice, this means binding commitments must be made by developed countries: treaties must be signed and ratified, and monies must continue to flow. Concurrently, developing countries must continue to demonstrate that they are committed to achieving results by undertaking appropriate national level planning and legislative activities, and creating the necessary enabling conditions for public and private sector producers to deliver at scale in a manner that is environmentally effective, economically efficient, and equitable. Transparency will be important here.

Appendix

1. Provide guidance
2. Arbitrate and enforce
3. Manage international register
4. License auditors
5. Agree international treaty
6. Set market rules
7. Ratify international treaty
8. Set national plan
9. Set participation rules
10. Enact regulations
11. Provide finance
12. Provide insurance
13. Produce
14. Measure and monitor
15. Report
16. Audit (verify and validate)
17. License operators
18. Arbitrate
19. Measure and monitor
20. Account
21. Manage national register
22. Report
23. Audit (validation / verification)
24. Measure and monitor
25. Aggregate production (sellers)
26. Hosting and information
27. Process and log transactions
28. "Regulate" market
29. Aggregate consumption (buyers)
30. Treasury
31. Report

1. Provide guidance



Given the scale of the challenge, the dynamics and complexities of the terrestrial carbon system and the extent of the implementation changes needed, many actors are looking for guidance:

- In support of both international and national policy setting, to better understand i) the impacts of different policy choices, and ii) the ability to operationalise these policies on the ground.
- In support of implementation as agents engage in readiness, demonstration and early action activities, and during the transition to full implementation.

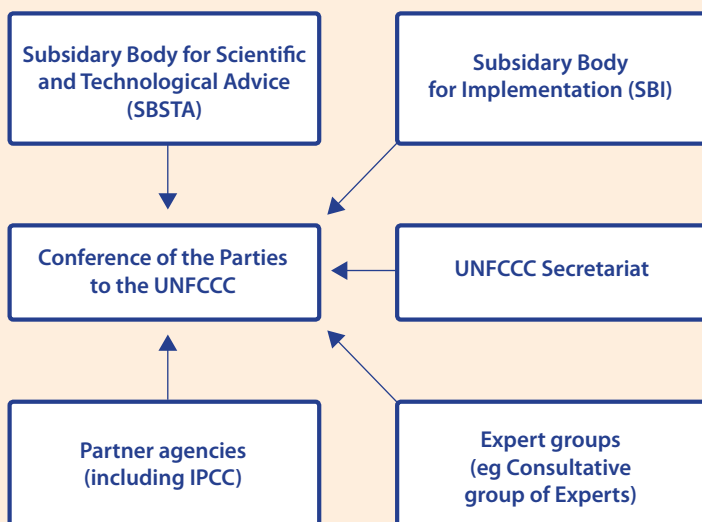
More specifically, this function incorporates:

1. Synthesis of information to provide good practice, guidance and set or harmonise these practices and standards (as far as is desirable and possible)
2. Facilitation of the development of knowledge and expertise, in both research and application, including knowledge transfer across countries

This guidance encompasses a variety of dimensions, including scientific, economic, social, financial, technological, political and legislative aspects. It is needed whether an international framework and / or other multilateral and bilateral arrangements are agreed. Guidance on best practice, in particular for measuring and monitoring is crucial for fostering information comparability and fungibility for standards across global data sets.

In terms of guidance to the international policy setting process, the Conference of the Parties (COP) is supported and guided by various advisory and technical bodies (Figure 6). These bodies are themselves guided by a wide range of institutions across the political, NGO, research, academic and corporate communities.

Figure 6:
Guidance to the international process and Parties



The IPCC through its reports, including the Good Practice Guidelines³⁸, is already advising the policy setting process and early action, as are many other organisations and networks of associations across the public and private sectors, both formally and informally. This includes multi-lateral institutions such as the World Bank, the UN-REDD Programme, government institutions such as Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO), the US National Aeronautics and Space Administration (NASA) and Brazil's National Institute for Space Research (INPE), research institutions such as the Smithsonian Institution, academic institutions (eg Yale University's School of Forestry and Environmental Studies) and NGOs (eg Resources For the Future, Conservation International, World Wide Fund for Nature (WWF), The Nature Conservancy (TNC), Flora and Fauna International etc).

To be most effective, the guidance produced should be as complete and compatible as possible. To enable this, and to facilitate the transfer of knowledge and expertise to practitioners, it may be advantageous for these institutions to operate as an affiliated network, with single guiding body to coordinate, support and drive the transition to a new terrestrial carbon management approach. This would be mandated by the Parties, and could be used by the COP, a successor to the Kyoto Protocol's Facilitation Branch (see Box 8) and all other participants looking for guidance as needed. This mandate could be given to an existing institution, or a new one. The newly formed 'Global Carbon Capture and Storage Institute' for fossil fuels provides a precedent for this.

Box 8 Global Carbon Capture and Storage Institute

The Global Carbon Capture and Storage Institute (GCCSI) is aimed at accelerating the worldwide commercial deployment of at-scale CCS. Announced by the Australian Government in September 2008, it was formally launched in April 2009 and became an independent legal entity in July 2009. To date, more than 20 national governments and over 80 leading corporations, non-government bodies and research organizations have signed on as foundation members or collaborating participants..

The GCCSI will draw together information, knowledge and expertise to build a central base, advising on the technologies, costs and benefits of CCS and the operational and legislative requirements. It is hoped it will play a pivotal role in facilitating the development and deployment of safe, economic and environmentally sustainable commercial-scale CCS projects. It will work collaboratively with governments, non-government bodies and the private sector.

For more information see: www.globalccsinstitute.com

³⁸ "Good Practice Guidance for Land Use, Land Use Change and Forestry" 2003 – Edited by J. Penman, M. Gytarsky, T. Hirashi, T. Krug, D. Kruger, R. Pipatti, L. Buendia, K. Miwa, T. Ngara, K. Tanabe and F. Wagner. Published by the Institute for Global Environmental Strategies (IGES) for the IPCC. For a full list of IPCC publications please refer to: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.htm

2. Arbitrate and enforce



In any system which involves agreements between countries (whether in the form of an international treaty, multilateral or bilateral deals), there will be a need for independent adjudication between those countries on matters of dispute. That is, for an arbitrator with powers of enforcement.

In the case of arbitration between Parties signed up to and participating in an international system, the remit of this arbitrator might include disputes on:

- i) adherence to Parties' emission reduction commitments
- ii) adherence to methodological or reporting commitments
- iii) the credibility of submitted national development plans and assessments (including reference levels).

Where Parties are participating in other multilateral or bilateral deals, then the remit of arbitration will be dictated by the terms of those deals, typically with the contract stipulating the national law to be applied (eg English law) and a designated arbitration court (eg the London Court of International Arbitration).

In terms of arbitration between participants in an international treaty, a precedent for this is the Enforcement Branch of the Compliance Mechanism for the Kyoto Protocol. This body is responsible for determining whether an Annex I Party is in compliance with its emissions targets, and determines consequences for Parties not meeting their commitments, with the support and guidance of Expert Review Teams (see Box 9).

In addition, it is also possible that this designated international arbitrator could act as a 'court of appeal' for matters of dispute in country unresolved by national arbitration procedures (see National level "Arbitrate", Function 18).

Box 9

Compliance Mechanism of the Kyoto Protocol: Guidance and enforcement

The objective of the Compliance Mechanism is to facilitate, promote and enforce compliance with the commitments under the Protocol.

Branch 1: Facilitation.

Provides advice and assistance to Parties on implementing the Protocol and promotes compliance with their commitments. It may also provide "early warning" of potential non-compliance. It can decide to provide advice and facilitation of assistance to individual Parties regarding the implementation of the Protocol, facilitate financial and technical assistance to any Party concerned, including technology transfer and capacity building and/or formulate recommendations to the Party concerned.

Branch 2: Enforcement

Responsible for determining i) whether an Annex I Party is not in compliance with its emissions targets, ii) the methodological and reporting requirements for greenhouse gas inventories, and iii) the eligibility requirements under the mechanisms. It also determines the consequences for Parties not meeting their commitments. For instance, where the emissions of a Party are determined to have exceeded its assigned amount, the Enforcement Branch must declare that the Party is in non-compliance and suspend it from making transfers until re-instated. It will also require the Party to make up the difference between its emissions and its assigned amount during the second commitment period, plus an additional deduction of 30%, and to submit a compliance action plan. A Party whose eligibility is withdrawn or suspended may request to have its eligibility restored if it believes it has rectified the problem and is again meeting the relevant criteria.

Deliberation process:

Based on assessment of reports from expert review teams, the subsidiary bodies, Parties and other official sources. Intergovernmental and non-governmental organizations may submit to the relevant branch after the preliminary examination. As a general rule, decisions taken by the two branches cannot be appealed. The exception is a decision of the enforcement branch relating to emissions targets. Even then, a Party can only appeal if it believes it has been denied due process.

Governance:

Both branches are composed of 10 members made up of representatives from each of the five official UN regions (Africa, Asia, Latin America and the Caribbean, Central and Eastern Europe, and Western Europe and Others), one from the small island developing States, and two each from Annex I and non-Annex I Parties. Decisions of the plenary and the facilitative branch may be taken by a three-quarters majority, while decisions of the enforcement branch require, in addition, a double majority of both Annex I and non-Annex I Parties.

http://unfccc.int/kyoto_protocol/compliance/introduction/items/3024.php

3. Manage international register



An international register is required in order to log mitigation activities, ie new sequestrations and avoided emissions. The register is a list of audited (eg validated and verified) activities and includes information on:

- The nature of the activity
- An estimate of the CO₂-equivalent of the emissions avoided and / or the CO₂-equivalent of the sequestration
- Country and geographical coordinates where the activity is taking place
- Entities (ie producer) responsible for the activity, including the entity qualifying for incentives for the mitigation reward
- The date the activity was started, and time-sensitive information (eg on harvests and date of next required audit)
- The purpose of an independent entity gathering this information in one central place is to ensure that the information submitted by different countries (or stakeholders) is of an acceptable minimum quality and is comparable to activities occurring elsewhere. This information will also allow policy-makers to estimate each nations' (or stakeholders') progress towards meeting commitments.

In the context of a market for carbon credits, the register will also log independently audited and quality controlled "carbon credits", including information on carbon credit status and ownership. This might include information with regards to timing of the first issuance of the credits, and who they belong to.

The register must be compiled and managed by a central, independent body with no commercial interests. The UNFCCC already maintains several registers of activity, including for CDM carbon credits issued ("CDM Registry")³⁹. Annex I (purchasing) nations also maintain registries of activities logged with their DNAs⁴⁰. The European Union, which is implementing the Kyoto Protocol as a "bubble" also maintains an independent registry⁴¹.

39. The CDM Registry relies on a standardized electronic database to ensure accurate accounting of the issuance, holding and acquisition of credits. Four types of accounts exist: Pending Account (where credits are first issued into), Adaptation Fund account (to hold the 2% share of proceeds levied on all transactions except those in least developed countries), Temporary Holding Accounts (for project participants with authorisation from an Annex I Party wishing to receive credits and whose national registry is not yet connected to the International Transaction Log), Permanent Holding Accounts (project participants registered in a CDM project with authorisation from a Non-Annex I party to receive credits before they are forwarded to participants with holding accounts in Annex I parties). For more information see: <http://cdm.unfccc.int/Registry/accounts/index.html>

40. For example, the Environment Agency operates and maintains the UK GHG ETS Registry, containing registers of: operators ("Operator Holding Account"), verifiers, personal holding accounts and external trading organisation ("AAR Organisation"). For more information see: <http://emissionsregistry.environment-agency.gov.uk/Default.aspx>

41. This is the Community Independent Transaction Log (CITL). The connection between the CITL, the UNFCCC International Transaction Log (ITL) and Member State Registries was completed on 16 October 2008. The CITL provides links to operating Member State registries. For more information, and a list of the Member State Registries please refer to: <http://ec.europa.eu/environment/ets/registrySearch.do>

4. License auditors



To maximise the chances of effective operation in country and to protect all participants, having established the rules and minimum standards of operation (see Function 8 “Set national plan”), it is then necessary to ensure that all auditors are adhering to the same agreed standards. This process bestows “Designated Operational Entity” (DOE) status and is a prerequisite for organisations carrying out any auditing procedures (validation and verification, and requesting registration on behalf of project developers)⁴².

In essence, the Function is to accept, approve and endorse activities and agents by carrying out an initial assessment, followed by regular review (regularly scheduled audits and possible spot checks). The licensing entity would have the power to recommend the issuance or suspension of rewards (eg credits) depending on performance against agreed standards.

The exact nature and scope of this process will be determined by the international agreement. For example, a bilateral agreement could stipulate the use of existing CDM DOEs as being the organisations with authority to audit the product agreed in the contract (eg carbon mitigation).

In the CDM, where there is no national liability for performance failure, licensing is carried out at the international level. Under the JI “Track 2” mechanism, the Joint Implementation Supervisory Committee (JISC) is “responsible for the accreditation of independent entities in accordance with standards and procedures”⁴³. The Accredited Independent Entity (AIE) is the equivalent of the DOE (see Box 7 for more details).

In this system where national liability is envisaged, then licensing could be carried out by a Government mandated provider, potentially with international oversight and arbitration (Function 2). Alternatively, this function could be carried out at the international level. It may be that a dual track approach, similar to the JI system, will be in operation, with national control for more advanced countries, and recourse to international provision for less advanced countries.

42. A DOE under the CDM is either a domestic legal entity or an accredited and designated international organisation. This entity validates and requests registration of a proposed CDM activity, and subsequently verifies emission reductions of the project activity, and requests the CDM Board to issue CERs accordingly. For more information please see: <http://cdm.unfccc.int/DOE/index.html>

43. For information on JI AIEs please see: <http://ji.unfccc.int/AIEs/index.html>

5. Agree International Treaty



Unlocking terrestrial carbon's significant potential for mitigation requires better management of our terrestrial carbon at scale. This requires agreements between nations. Private, bilateral and multilateral deals are already being made and will continue to play an important role, not least because of their flexibility and relative speed of implementation.

Arguably, however, the most effective means to achieving the scale of change necessary is to agree a post-Kyoto treaty which provides a clear, consistent and comprehensive framework within which all agents can operate.

The next climate change Protocol, and its provisions in respect of terrestrial carbon, is currently being negotiated. The prime authority is the Conference of the Parties (COP), the association of countries belonging to the United Nations Framework Convention on Climate Change (UNFCCC). It is supported and guided by various advisory and technical bodies, and logistically supported by the UNFCCC secretariat (see Function 1: 'Provide guidance').

It is to be hoped that the high level framework of the treaty will be reached at COP 15 in Copenhagen in December 2009 and the detailed requirements underpinning it will be agreed shortly thereafter. The terms agreed will govern the five year commitment period from 2013 to 2017.

Prior to the start of this period, it is likely that the COP will also need to review and accept the plans of individual Parties as a pre-condition to their participation in the system (see Function 8 "Set national plan" for more details").

Terms governing subsequent commitment periods are subject to future negotiation. However, terms agreed for the 2013-2017 commitment period should set a solid foundation for future adaptation and expansion as information, technology and capacities advance.

Following successful negotiation, commitments made will need to be ratified by nation states (see "Ratify treaty" Function 7).

N.B. The remainder of this section is written with the assumption that a new, international agreement will be reached (ie a successor to the Kyoto Protocol under the UNFCCC). However, the points raised are equally applicable to any multilateral or bilateral arrangement agreed.

The agreement of a strong treaty is crucial to send a clear signal to all parties involved in implementation. Implementing the changes stipulated by the agreement will require a significant investment of time, money and political capital from a wide range of actors. All these parties will need to be re-assured that their efforts will be rewarded in the future.

Clarity of the rules of the game and certainty over long term demand are essential in order that well-informed assessments of potential implications, costs and benefits are made and necessary planning and capacity building begins and is scaled. Specifically, the treaty will need to address the following three remaining aspects as described in this report:

- What incentives are offered for: Which terrestrial carbon pools and land use types or activities are covered by the agreement, this includes any criteria for participation and the basis of reward (encompassing the reference level determination and the role of any stabilisation funds or similar).
- The sources of monies to supply those incentives: The mix of public and / or private sources.
- Collation and disbursement mechanisms to deliver payment: The use of any fund and/ or market mechanism.

The treaty will need to provide a clear signal of ongoing and sustained demand and payment from non-forest nations. In this context, this means developed nations making binding commitments to:

- Significant emissions reductions targets and commitment that a substantial part of these commitments can and are likely to be fulfilled by accredited terrestrial carbon offsets, and
- Ongoing funding for (activities which result in) carbon emission reductions or increased sequestration that do not result in compliance carbon credits.

N.B. It is likely that the source of the resulting liability will remain at the discretion of each nation state and will not be set within this international framework – see "Treasury" Function 30.

Commitments on both these aspects are needed as it is likely that multiple approaches and sources of finance will be needed to suit a variety of circumstances and timetables.

N.B. For a discussion of the key aspects of the REDD framework, and countries' current positions on these questions, see "The Little REDD+ Book: An Updated Guide to Governmental and Non-Governmental Proposals for Reducing Emissions from Deforestation and Degradation".

For a discussion and estimation of the likely scale and timing of emission reductions needed please refer to the IPCC website⁴⁴. For a discussion and estimation on the likely scale and timing of financing needed see the Eliasch Review⁴⁵ and CIFOR Info Brief No. 18⁴⁶.

Lastly, given the dynamics and complexities of the terrestrial carbon system and the extent of the changes needing to be implemented, many countries will also need guidance for implementation. See Function 1: 'Provide guidance'.

44. The IPCC website contains links to Assessment Reports (a synthesis report of the latest information on climate change), Special Reports (reports providing in-depth information on specific issues), Methodology Reports and links to the Data Distribution Centre which provides data sets, scenarios of climate change and other environmental and socio-economic conditions. Website: www.ipcc.ch

45. The Eliasch Review: "Climate Change: Financing Global Forests" (2008). This report suggests that US\$ 17 – 33 bn is required per annum to halve deforestation. See: [http://www.occ.gov.uk/activities/eliasch/Full_report_eliasch_review\(1\).pdf](http://www.occ.gov.uk/activities/eliasch/Full_report_eliasch_review(1).pdf)

46. CIFOR Info Brief 18 (November 2008). Ruben N. Lubowski, "The role of REDD in stabilising greenhouse gas concentrations, lessons from economic models". This study suggests that halving global deforestation will cost between US\$ 7 bn and 28 bn per annum. See: http://unfccc.int/files/methods_science/redd/application/pdf/the_role_of_redd_in_stabilising_greenhouse_gas_concentrations.pdf

6. Set market rules



This function concerns the setting of rules for all markets established or used to trade certified units of terrestrial carbon mitigation at the national (eg, a domestic emissions trading scheme like that proposed in Australia), regional (eg, the EU ETS) and / or international level (eg, the rules set by the Kyoto Protocol or its successor). Market rules may be intended to foster the development of an efficient and effective use of monies. Aspects that may be regulated include the type of product that can be exchanged, how it should be exchanged, by whom and any other additional issues (eg price floors or caps, relations with other markets).

Some precedent for this type of function exists. The EU ETS for example, is based initially on rules embodied in the UNFCCC and its Kyoto Protocol, additional market rules were created through the EU-specific regulation, including the EU ETS “linking directive”.⁴⁷ One example of how these rules differed slightly from those embodied in the Kyoto Protocol was that carbon credits from CDM A/R activities were not allowed into the EU ETS and as a result there was no reason for covered entities to use them for compliance and as a consequence no demand⁴⁸.

Other non-Annex I countries have varying rules governing their national markets and the implementation of the Kyoto Protocol, for example Japan⁴⁹ and New Zealand⁵⁰.

For countries implementing their own market rules as a result of the Kyoto Protocol, they will need to make national decisions on compliance rules including on covered entities, allocation method, any cost containment methods and considerations of national competitiveness which will affect the market. Other considerations in setting the market rules are infrastructure, including taxation, national registry management (see Function 21) and links to emission trading schemes in other countries.

Another example of a more recent precedent is the US Regional Greenhouse Gas Initiative (RGGI), for which rules are set using a common “Model Rule” which provides the rules allowing states to be linked through CO₂ allowance reciprocity.¹⁴ The “Model Rule”⁵¹ was developed by representatives from the participating states with public input. Rules cover issues such as coverage (ie covered entities), emission cap, starting date and compliance period, auctioning, use of offsets etc.⁵²

It is likely that in any future agreement, participating states will be required to set their own market rules, either individually or in a “bubble” (eg the EU) within the general parameters set by the agreement (in this case the UNFCCC and any successor to the Kyoto Protocol). In a situation where the “market” is expanded (eg commitments from current non-Annex I countries), this will require countries to design national or regional market rules. If this occurs, any market rules must be consistent with the national plan (Function 8), including participants (Function 9), national register management (Function 21), etc.

The governing international body or groups of international bodies (or indeed nation states) may wish to appoint an entity that regulates the market. For example, both the EU ETS and the RGGI are examples of more decentralised models where individual states agree to a set of market regulations but these

are managed largely within the member states or countries. A more centralised and actively managed example of this function could be a central bank, such as the European Central Bank, which is tasked with defining and implementing the monetary policy of the Eurozone. An International Emissions Trading Association (IETA) currently exists and this body could provide input and support to the development of a body to set rules for an international market. There are some signals that the various markets are moving towards better coordination, through for example the International Carbon Action Partnership (ICAP)⁵³ which provides a forum for sharing experiences with carbon markets, with the ultimate aim of fostering the linkage of current and emerging carbon markets. These are discussed in further detail in Function 28: Regulate market.

Given the nature of the organisation’s responsibilities, ie regulation of private enterprise, it would however, for issues of neutrality, be most appropriate for the Function to be carried out by a centralized, independent multinational institution or body.

47. A list of the EU legislation which resulted in the creation of the EU ETS (and as a result the EU market rules) can be found at: http://ec.europa.eu/environment/climat/emission/implementation_en.htm

48. The primary reason for this is most likely the temporary nature of CDM A/R credits – these expire and thus create a liability. There was much concern about how to incorporate these into the system and they were consequently banned. National governments, however, are allowed to use these types of activities to meet their Kyoto Protocol commitments.

49. Japan’s emission trading scheme (market) is embodied by its “Kyoto Protocol Target Achievement Plan” and other regulations set out by the Japanese Ministry of Environment.

50. New Zealand has recently amended its climate change bill. Information on the amendments and New Zealand market rules can be found at: <http://www.climatechange.govt.nz/emissions-trading-scheme/index.html>

51. The “Model Rule” is a set of proposed (market) regulations that form the basis for each participating states’ CO₂ budget trading program. The program is supported by a “Staff working group” with representatives from all the participating states. For information on RGGI please refer to their website: <http://www.rggi.org/about>

52. Information on RGGI can be found at: www.rggi.org

53. The ICAP is a forum working towards the harmonization and future linkage of carbon trading schemes. ICAP includes member from the European Union, RGGI, Western Climate Initiative (WCI) as well as Australia, New Zealand, Norway and the Tokyo Metropolitan Government. For more information see: www.icapcarbonaction.com

7. Ratify international treaty



Following successful negotiation, commitments made by Parties in an international treaty will need to be ratified by national Governments before it will enter into force in those countries. The process for this will vary country by country. Consequently, the speed and timing of ratification will also vary from country to country.

A significant factor in this will be the relation of this new treaty to the Kyoto Protocol. If it is deemed to be an extension of the Kyoto Protocol, then countries which have already ratified the Protocol should be able to ratify the new treaty relatively speedily. If not, the process could take significantly longer.

Most countries require treaties to be approved by Parliament or equivalent before they can formally enter into force, although the exact procedure varies by country. For example, the US requires the treaty to be advised and consented by a two-thirds vote in the Senate, rather than a simple majority. In the UK the "Ponsonby Rule" requires that most international treaties be presented to Parliament 21 days prior to ratification.

8. Set national plan

This function is needed to ensure that each nation develops a coherent, realistic plan of how it will achieve its targets or commitments. Making these assessments and plans a prerequisite to participation should increase the likelihood of success. It is envisaged that some variant of this would be needed regardless of whether nations are participating in a system governed by an international treaty, or alternatively whether undertaking multilateral or bilateral deals.

The details of these national plans should be determined in conjunction with any international agreements entered into (see "Agree international treaty" Function 5). They will also need to be reflected in the rules and mechanisms envisaged and set for participation within the country, and the regulatory framework in country, see "Enact regulations" (Function 10) and "Set participation rules" (Function 9).

For a producer country, this might include:

- Implementation plan: to achieve agreed targets/ commitments - possibly as one part of a low-carbon development plan or NAMA, including envisaged quality assurance and quality control (QA/QC) regulations
- Capacity needs assessment: based on current capabilities and the needs identified in the implementation plan
- Reference level (benchmark): against which improvements can be assessed, validated and rewarded
- Carbon inventories and emissions data, including a measurement and monitoring plan
- Reports on early action in a specified period up to 2012, for consideration of early action credit if appropriate

In the case of a system governed by an international treaty, this plan will need to be submitted to the COP for review and acceptance (see "Agree international treaty" Function 5).

In the case of multi-lateral and bilateral deals, it will need to be submitted to the party with whom the deal will be made.

For a consuming country, this might include a low carbon development plan and associated emissions projections to inform and support their emissions reduction commitments.

It is most likely that the entity developing and submitting this plan will be the national Government. This is because:

- i) it is envisaged that accountability will be at the national level
- ii) these plans must be consistent with national priorities
- iii) sustainable and effective implementation will require integrated national policies.

The nature of this process will be determined by each national Government as they see fit. Already, some forest countries have established a national Office or Council of Climate Change⁵⁴ or provided similar mandates within governments to coordinate between the many branches of government that should be

involved in the development and implementation of these plans, and to coordinate with civil society and other impacted and influential parties (for an example from Indonesia, see Table 3).

Countries supported by the UN-REDD Programme and the World Bank FCPF receive support to develop and implement national REDD strategies and mechanisms.

Pilot activities to develop such national plans are underway in: Democratic Republic of Congo, Tanzania, Zambia, Indonesia, Papua New Guinea, Viet Nam, Bolivia, Panama and Paraguay (supported by the UN-REDD Programme)⁵⁵. The World Bank's FCPF is supporting 37 countries through its Readiness facility⁵⁶.

Early indications are that given the wide ranging scope and information needs, and the need for broad stakeholder engagement, Parties may vary considerably in the time taken to design and implement such plans. It is also likely that there will be a need for ongoing reassessment and amendments to these plans over time. To implement this plan, a new legal framework may need to be enacted – see Function 10 "Enact regulations".

54. For example Papua New Guinea are establishing an "Office of Climate Change & Carbon Trade": www.climatechangepng.org

55. Please see: <http://www.un-redd.org/UNREDDProgramme/CountryActions/tabid/584/language/en-US/Default.aspx>

56. See the World Bank FCPF website: <http://www.forestcarbonpartnership.org/fcp/node/203>
57. This information is from the Indonesian proposal submitted to the UN-REDD Programme and available at www.un-redd.org

Table 3:
*Government and government-established institutions for REDD in the Republic of Indonesia*⁵⁷

Name of Institution	Mandate
Ministry of Forestry	Responsible for the overall management of forest areas, including improvement and managing public access. Focal point of UNFCCC for Indonesia, with the Ministry of Environment. They also set up the Indonesian Forest and Carbon Alliance (IFCA) - a multi-stakeholder alliance established and managed by the forestry research agency (FORDA), as an initial step to REDD-Readiness.
Directorate General of Forest Plan (the forest spatial planning directorate "Badan Perencanaan")	The forest spatial planning directorate under the Ministry of Forestry. Responsible for the Forest Resource Inventory System (FRIS) and integrated into the National Carbon Accounting System (NCAS) which monitors terrestrial carbon. FRIS will be the MRV basis for REDD and GHGs.
FORDA (Forestry Research and Development Agency "Badan Litbang Kehutanan")	Manages and leads the IFCA process. Leads the REDD methodology and conceptual development. Conducted a series of studies on different aspects of REDD organised through the establishment of several working groups..
IFCA (Indonesian Forest and Carbon Alliance)	Conducted a series of studies on different aspects of REDD organised through the establishment of several working groups managed by FORDA and coordinated by the World Bank.
Directorate General of Forest Production	Responsible for the management of production forest and industrial forestry estates. Sets production targets and decides on the use of production forest areas.
Climate Change Working Group in the Ministry of Forestry ("Kelompok Kerja Perubahan Iklim Departemen Kehutanan")	Newly established body in the Ministry of Forestry with authority to advise the Minister on policy, strategic planning, implementation of programs and activities and the facilitation of any initiatives from stakeholders related to climate change adaptation and technology transfer (including through the CDM and REDD). Established by SK Menhut No. SK. 13/ Menhut-II/2009
Ministry of Environment	Involved in implementation of REDD through environmental impact assessments and environmental service concessions. Primary focal point to the UNFCCC.
Coordinating Ministry of Economic Affairs	Responsible for mainstreaming climate change into general development policies. Instructed by the President through Presidential Instruction 5/2008 to the Ministries of Forestry and Environment to issue REDD regulations and gives a clear mandate to coordinate REDD implementation.
BAPPENAS (the national development planning agency)	Coordination of implementation of bilateral and multilateral projects including REDD pilots funded by AusAID and BMZ (German Federal Ministry of Economic Cooperation and Development). Working towards the establishment of a climate change multi-donor trust fund. It has initiated project ideas; presented the national development response to climate change ("yellow book") to initiate the development of equitable and efficient REDD value chain and payment mechanism. It is responsible for development and management of national REDD fund. It leads international coordination and overall coordination with line ministries.
Ministry of Finance	Responsible for the design and implementation of payment mechanisms – eg a possible 30% levy on REDD generated revenues and a possible national fund, including a Public Service Agency (BLU) to manage REDD finances, similar to that managing revenues generated through the reforestation levy.
Ministry of Public Works / General Directorate for Spatial Planning	Responsible for national spatial planning, oversees implementation of law 26/2007.
Ministry of Home Affairs	Oversees decentralisation and provides overall guidance to the districts with regards to the spatial and economic development planning.
Ministry of Agriculture	Manages the state owned estate crop companies and the development of palm oil production in Indonesia.
Ministry of Trade and Commerce	Responsible for trade-related issues and its policies impact prices and volumes of palm oil, paper and pulp, plywood and other agricultural and forest-related products.
BAKOSURTANAL	Responsible for updating and managing spatial and mapping data for the country
Provincial / District Government with special autonomy	The special autonomy law has let the provinces of Aceh and Papua control their own forest management
National Climate Change Council (NCCC-DNPI)	Newly established. Composed of six government working groups to deal with issues of adaptation, mitigation, technology transfer, finance, forestry and post-Kyoto issues. The exact roles and responsibilities of the forestry working group and links to IFCA are not yet clear. Potentially critical in establishing the Indonesian policy and regulatory framework for REDD. Has been given considerable authority to advise and oversee implementation of climate change adaptation and mitigation policies. Likely to be the future UNFCCC focal point. Relationship with the Ministry of Environment as yet unclear. Established by PP No. 46/2008

9. Set participation rules



As with the related Function 8, “Set national plan” this function is needed to ensure that each nation develops a coherent, realistic implementation plan for how it will achieve its international commitments. Specifically, this means identifying the actors involved in delivering the national plan and how they are incentivised to do so. This function therefore provides clarity to all potential participants and implementers as to how the mechanism might operate within the country. It is envisaged that some variant of this would be needed regardless of whether nations are participating in a system governed by an international treaty, or, undertaking multilateral or bilateral deals.

The specifics of the design will vary according to many factors, not least by country circumstance and the nature of the system in which the country is participating. Regardless, it must be in line with international expectations and be consistent with national priorities.

For both producing and consuming countries, likely elements might include:

- Allocation of mandates and delegation of authority, within government and beyond. This includes the assignation of a Designated National Authority (DNA) to oversee the operation of the system in country.
- Specific rules governing the operation of the system within country, including the basis on which revenue will be disbursed in producing countries and finance will be raised in consuming countries, and any pre-requisite requirements for participation. This may include additional market regulations to supplement Function 6 “Set market rules”.
- Standards to be applied to participants and in the auditing process (refer to Functions 16 and 23).

These decisions can only be made by a national body mandated by the national Government. This role could be further developed or specialised once a more complete agreement on limiting emissions and enhancing sequestrations from land use is developed.

10. Enact regulations



In the course of setting a national development plan and determining the in country mechanism (see “Set national plan” and “Set participation rules” Functions 8 and 9), nations will have determined the necessary changes and new frameworks that need to be established in country. These changes and frameworks may require those nations to enact a new regulatory framework, either through the creation of new legislation, and/ or changes to existing legislation. At the very least, it will require a review of existing legislation for potential inconsistencies or gaps, for example, with regard to existing legislation on land tenure, asset ownership and foreign direct investment.

In this process, on the production side, overarching elements that must be considered include, but are not limited to⁵⁸ : institutional mandates, the nature of rights or interest in forest / environmental benefits, competing interests, participation, relationship among national / sub-national level activities, crediting or funding mechanism, management of national pool or buffer, rights of forest-dependent communities and indigenous peoples, taxes and state payments, powers of responsible institution and definitions used (eg how to define “forests”).

This function must be fulfilled by the national government. There are precedents in the AFOLU-related carbon sector; for example, Indonesia has reviewed existing forest sector strategies and policies in terms of conservation, production, conversion forests, palm oil development and forest peat lands to ensure they fit with new legislation that they are implementing on REDD (see Box 1).

Depending on the extent of legislative changes, and on stakeholder engagement, it is estimated that it will take each country a minimum of one year to review the existing legislative framework and augment or change as needed, possibly a lot longer.⁵⁹

58. Please refer to: “Background Analysis of National REDD Regulatory Frameworks – Summary”, UN-REDD Programme with the Terrestrial Carbon Group. June 2009.

59. For example, according to the Government of Suriname R-Pin submission to the World Bank FCPF, the Presidential Committee on land rights, established in 2006, took two years to review relevant legislation and present their results. This R-Pin can be found at: http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/Suriname_R-PIN_Revised_Feb_2009.pdf

11. Provide finance

Investment capital is needed, in the form of grants (state budget support and philanthropic capital), debt and equity to finance production as well as the activities required to meet production criteria (such as national approval processes in producer countries). This function deals with monies required for the direct production activities only, it is assumed that the national oversight functions related to production will be financed through the treasury (Function 30). There are many different types of actors who could provide financing. The mix of financing (and financier) will depend on:

(i) what is to be financed (eg national plan development, MRV, A / R activities etc)

(ii) profile of the financier (eg, type and size of the opportunity in comparison to the type and size of funding the financier can provide⁶⁰, risk appetite)⁶¹

(iii) the needs and status of the system as it evolves (eg, state, multilateral or philanthropic support may initially be required to develop the necessary infrastructure, but as infrastructure is developed (such as MRV capacity) there may be a move to self-sustaining financing).

As a result, there will be many different types of finance providers, with varying objectives. These objectives might be to:

- i. Make a return on privately sourced capital, arising from: Interest payments arising on monies lent, with ultimate return of the capital), A return on an equity investment, eg through sale of a company or shares of a company, or listing on an exchange, the sale of products, eg carbon offsets, timber or Non Timber Forest Products (NTFPs)
- ii. Carry out a government spending program, enshrined in the state budget
- iii. Utilise a private (philanthropic), government or multilateral grant

The international and national conditions will determine the most suitable type of financing. The main issues as they relate to the categories described above are:

Grants, state budget support (through DFIs and state budgets in producer countries), philanthropic capital

Philanthropic capital or grants from the state budget depend on available resources and degree of “fit” with the goals for which that capital is earmarked. Such an allocation also needs to be able to demonstrate that it is for the “public good”. The use of development assistance to develop carbon offset projects has been constrained in the past; eg any ODA used to develop and implement such activities must be additional to existing assistance. Examples of existing development assistance providers for these types of activities include the World Bank, the UN-REDD Programme and the Government of Norway.

Funds available through state budget support are a function of the wealth of the country and relative importance given to the sector and activity. This function may be a reflection of the country’s perceived ability to take advantage of incentives.

The Government may also establish a private company to carry out operations, financed by the Government (equity and / or debt); an example is the Brazilian national oil company, Petrobras.

Examples of grant providers include the World Bank’s Forest Carbon Partnership Facility, AusAID’s support of Indonesia’s national REDD development program and grants made available through the David and Lucile Packard Foundation.

Debt

The security and predictability of returns affects the ability to secure affordable debt, ie the security and predictability of cash flows which can help an activity to repay principal and interest on the debt. For example, an off-take agreement for the product may help to access debt. This is affected by the type of activity, for example many agricultural production activities yield annual products (crops) while forestry operations take longer (and have longer gaps) to generate the product.

Country and market risk eg the maturity and ease of doing business in a country will be improved by government credit/ financing support, which will lower the risk⁶², and allow lenders to provide cheaper debt. National government support (eg national buffers or a material commitment by the national government to help support production, for example by investing in high quality national MRV) and international support (eg through a MIGA) can help to bring down the cost of debt. A large, mature and liquid “market” for carbon offsets can also help to reduce risk and encourage lending. Cheaper debt could also come from multilateral lending agencies⁶³ or from state banks⁶⁴ with a mandate to support certain types of activities.

Much of the current discussion around financing REDD has centred on “forest bonds”. A review of forest finance by Forum for the Future identified the issues and potential for forest bonds to be used to finance REDD+ activities.⁶⁵

Examples of entities that could provide debt to such activities include: multilateral lending agencies (eg the World Bank), development finance institutions (eg USAID), national development banks (eg Vietnam Bank for Agriculture and Rural Development) and traditional commercial banks (eg Standard Bank).

Equity

Perceived risk (eg size, risk and timing of expected returns, market maturity and precedents) affects a company’s ability to source equity funding. This will also impact the type of investor interested in the investment opportunity, their value-add and their return expectations. For example, early-stage Venture Capital (VC) investors will typically make investments in less mature, more risky activities and expect higher returns, whereas pension funds or sovereign wealth funds will typically seek more



secure, longer-term investments.

An investor will need to be able to plan for an exit from the holding. This can be in the form of a sale or a listing on an exchange. In order to sell the return, the market must be relatively mature and liquid. In order to list the company market and exchange rules must be relatively well-developed.

Another consideration is profitability (or expected profitability) compared to other investments; for example, in the CDM investors were drawn to industrial gas projects, and other types of emissions reduction project investments because of higher carbon credit prices, more fungibility of carbon credits and because credits could be produced once a year, rather than once every five years. The profitability of the various categories of terrestrial carbon production activities will vary, eg a RED activity will have different cash flows and returns from A/R activities or agricultural soil carbon activities. One particular issue related to REDD+ may be the ownership structure of most forest lands (less than 20% of the world's forest is in private hands)⁶⁶, which increases the risk of such investments. Traditionally, private investment flows into forestry operations in developing countries has been severely limited.⁶⁷

Examples of entities that could provide equity financing for activity implementing agents include: venture capital funds, high net worth individuals (HNWIs) and multilateral agencies including carbon credit funds⁶⁸. As the market matures, this might expand to include other types of investors.

For traditional forestry investments these are compounded by the very nature of the asset (high upfront cost, delayed returns). Private equity has been limited by a history of limited operational capacity and poor management reporting systems. These factors contribute to the illiquidity of investments in the sector and restriction on private capital flows which has helped to drive the aggressive behaviour leading to environmental damage. Please refer to the following paper for a complete description of the issues: "Forest Investment Review" (July 2009), Forum for the Future. Available from: <http://www.forumforthefuture.org/projects/forest-investment-review><http://www.forumforthefuture.org/projects/forest-investment-review> 68. Although the relatively short life of many carbon credit funds may not make them suitable to fund longer term REDD activities.

60. A particular issue with regards to forestry is that internationally, the market is poorly integrated into capital markets and producers therefore have restricted access to mainstream private capital. Additionally, the majority of the forestry markets are domestic (eg 86% of the wood harvested in Brazilian Amazon is consumed within Brazil), and contain a broad landscape of actors (eg a few large companies, a lot of small and medium-sized enterprises (SMEs)). SMEs in particular face financing constraints as they may suffer from social isolation, greater financial vulnerability, political marginalization and corporate expediency. For a more complete description please refer to: "Investing in natural tropical forest industries" (ITTO Tropical Forest Update 16/2, 2006). Available from the ITTO website: www.itto.int

61. Equity could be sourced from: venture capital funds, high net worth individuals, co-investment programmes, investment funds, banks, pension funds, insurance and re-insurance agencies, private equity, emerging markets equity funds. Possible debt could be sourced from: banks, export-import banks, capital markets, structured finance, and multilateral development banks. For a discussion of the different types of financiers and their differing requirements please refer to "Forest Investment Review" (July 2009), Forum for the Future. Available from: <http://www.forumforthefuture.org/projects/forest-investment-review>

62. For example refer to the World Bank Group's "Doing Business project", which provides objective measures of business regulations and their enforcement across 183 economies and selected cities and includes information on business regulations including ease of accessing credit. Please see: <http://www.doingbusiness.org/>

63. Eg from the World Bank. A specific example of this is the World Bank's long term support of the Indian forestry sector. For a summary and evaluation of this please refer to "India: Alleviating Poverty through Forest Development" (2000) available at: [http://lnweb90.worldbank.org/oed/oeddoclib.nsf/804270fcc33e9e885256808006a003b/c14758e94c1f79e985256970007b95b1/\\$FILE/India.pdf](http://lnweb90.worldbank.org/oed/oeddoclib.nsf/804270fcc33e9e885256808006a003b/c14758e94c1f79e985256970007b95b1/$FILE/India.pdf)

64. For example, state owned agricultural lending banks an example of which is the Vietnam Bank for Agriculture and Rural Development (VBAD) which provides short term, long term and special credit lines to agricultural, forestry and salt production activities. The Bank receives some support from development agencies (World Bank, Asian Development Bank, EU and the German KfW). For more information please refer to: <http://www.fao.org/ag/ags/agsm/banks/banks/vietnam.htm>

65. Issues surrounding this include: who is issuing the bond, pricing of the bond and comparability with other debt instruments with similar characteristics in terms of maturity, credit quality, coupon etc., the liquidity of the bond (related to the size), risk and who is eligible to buy the bond and government backing. "Forest Investment Review" (July 2009), Forum for the Future. Available from: <http://www.forumforthefuture.org/projects/forest-investment-review>

66. FAO, 2006: "Global Forest Resources Assessment 2005", Rome, Italy.

67. General risk factors associated with investments in developing countries include: political, land tenure, currency convertibility, appropriation of assets and operational difficulties. Therefore most private investors seek higher returns on investments in developing countries.

12. Provide insurance

Insurance in the context of this system refers to risk mitigation activities both in terms of financing and in managing environmental risks (eg, a catastrophic forest fire). In the case of an international system that provides economic incentives in exchange for proven mitigation from land use, these two issues are closely linked. Environmental risks can be ameliorated using high-quality MRV practices (including having well-functioning early warning systems) and efficient reporting practices, including on drivers of land use change. The description of this function concentrates on the management of more finance-related risks.

Any investor takes a risk with their investment, and the higher the risk the higher the necessary return to attract investment. However, for the foreseeable future, investments into production of mitigation from REDD+ activities are likely to be relatively high risk, without the necessary high return. Not only do these activities have high up-front expenditure and delayed revenue streams, they also operate in uncertain markets and are likely to be in locations with higher than average political instability and uncertain land tenure. A survey by the Clinton Foundation found that political risk was seen as the largest risk factor. All types of risks deter private sector investors.

While the private sector is working to develop insurance options for these activities, these options generally deal with more standard commercial and market risks, and do not address the political risks inherent in these investments (see Table 4 for descriptions and examples).

Furthermore, the banking and financial services in respect of forestry activities are currently very immature. The “Forest Investment Review”⁶⁹ found that the private finance sector does not typically have the capacity or appetite to take on and mitigate the risks specific to long-term forestry investments. Therefore, in addition to ongoing private sector risk mitigation options, there is a need for public sector action at the international scale to support and catalyse private sector investment.

The private and public risk mitigation options particularly pertinent to REDD+ and AFOLU investments (rather than the general mitigation of standard commercial risks) are detailed below in Table 5. Particular attention is drawn to the potential role of MIGA and GuarantCo in insuring these activities against political risk, an area of risk mitigation particularly underserved by the financial sector (see Box 10 for more details).

69. See the discussion in: “Forest Investment Review” (July 2009), Forum for the Future. Available from: <http://www.forumforthefuture.org/projects/forest-investment-review><http://www.forumforthefuture.org/projects/forest-investment-review>

Table 4:
REDD specific investment risks

Risk category	Standard risks	Enhanced or additional risks in REDD investments
Commercial risks = the risk that the commercial operations of the investment itself will fail, or fail to create adequate value	Crop failure (due to fire, drought etc) Credit risk	Long term nature of REDD investment increases these risks
Market risks = the risk that the surrounding market environment will cause a production activity to fail or reduce the value of the returns generated	Interest rate, price and currency volatility Regulatory regime changes	Forest carbon market is/ will be immature and therefore potentially particularly volatile Ability to extract value from successful activities may be compromised by overall national performance
Political risks = the risk that the action of sovereign or sub-sovereign entity will cause the production activity to fail or reduce the ability of the investor to extract capital	Cancellation of concessions/ license Expropriation of assets Import/ export embargos Destruction of the asset by war or other political activity	Enhanced political risk due to location of production activities.



Box 10

Case Studies: Public and private sector insurance of political risk

MIGA: A member of the World Bank Group created to promote foreign investments into developing countries, MIGA's Standard Guarantee programme provides risk insurance covering a number of elements of political risk, including currency transfer restrictions, expropriation, war and civil disturbance, and sovereign breach of contract. Its remit already covers REDD+ investment in the vast majority of countries targeted by REDD+ investment. Further, it is the only multilateral political insurer that can provide insurance policies to private sector investors from all 170+ World Bank member countries.

MIGA could potentially establish a dedicated, streamlined and potentially subsidized guarantee facility within MIGA for REDD 'certified' or 'categorized' projects and investment flows. MIGA's Small Investment Program provides a template for this. This programme targets a specific category of investment, with reduced insurance costs and a streamlined insurance process. Despite the relatively high transaction costs associated with individual small transactions, SIP premium rates are generally attractive compared with other political risk insurers in many countries. A MIGA-REDD programme could be subsidised (either internally or externally) in order to make it attractive to mainstream investors – although it is not clear whether such a subsidy of a multilateral insurer would be deemed anti-competitive.

Forum for the Future's informal discussions with MIGA indicate that such a programme would be of interest to MIGA. However, this facility would have to be significantly scaled up in order to meet the size of the expected requirement for investment in REDD+. It seems that SIP's two-year development timeline could be shortened significantly, especially if the internal resources required could be sponsored externally, and if there was a mandate from a major bank member.

GuarantCo: A private-public financial institution sponsored by DfID (UK), SECO (Switzerland), SIDA (Sweden) and the Dutch Ministry of Foreign Affairs. GuarantCo provides a credit guarantee facility for local currency debt exposures in emerging markets and covers infrastructure investment. Its products cover the full spectrum of risks involved in an investment. It seeks to provide coverage for up to 50% of the default exposure with the debt provider or other parties taking on the remaining risk. However, it can cover up to 100%.

The advantages of using GuarantCo for REDD investments are that it is mandated to promote long-term investment, it is conducive to the long-term REDD+ investment timeframe, and it covers all investment risks for debt investors. Although it currently has low capitalisation and would require significantly more capital to have an impact on REDD+ capital flows, at the end of 2008, GuarantCo negotiated an arrangement to increase its lending capacity from \$73 million to \$292 million through a leverage arrangement. Further, overall capacity is anticipated to rise to \$400 million in the near future, once GuarantCo's equity increases to \$100 million as proposed by its shareholders.

However, GuarantCo can currently cover only infrastructure element of REDD projects, ie not the majority of REDD project(s) and cover is relatively expensive (as covers all risks). Further, its maximum guarantee coverage is too small for some REDD+ projects and it only covers projects in the lower- and middle-income countries as defined by the Development Assistance Committee. Current significant exclusions are Brazil, Chile, Costa Rica, Malaysia and South Africa.

For GuarantCo to be scaled up for REDD, Governments will need to use their shareholdings to expand GuarantCo's remit to all types of REDD+ debt investments, subsidise risk premiums, provide expertise and technical assistance and underwrite the REDD investment risk.

<http://www.forumforthefuture.org/projects/forest-investment-review>

Table 5:
Options for risk mitigation for producers

Option	Mechanism	Who
Provide insurance (insures against losses due to specific political risk events)	Provision of insurance through public sector bodies	MIGA (see Box 10) Govt Export Credits Guarantee Depts.
	Leverage private sector insurance provision	eg Lloyd's, possibly with government subsidised cover
National and international registers and buffer systems	National or international risk mitigation measures (eg buffers)	National or international oversight bodies and managers of registers
Credit guarantees (covers default for any reason, political, commercial or market risks)	Provision of credit guarantees through public sector bodies	GuarantCo (see Box 10) USAID IFC Aggregator
Provide price floor/ guarantees	eg Guarantee to purchase a minimum quantity / at a minimum price	(see Functions 25 and 29)

13. Produce

The entity carrying out this function provides on-the-ground implementation and management of the production activities.

Activities associated with this function might include: development of the concept (including conducting an initial viability assessment), engagement with local stakeholders and day-to-day management (including disbursement of funds and collating sub-national level information which is reported to the national authority). In the case where this is a private-sector entity, the producer may also bring in investors and buyers. Production can be taken on as a “for-profit” or “not-for-profit” activity. There are many examples of how, and by whom, this function could be carried out.

‘For profit’ examples:

- i. A private sector company stimulated by a market, eg in the format of the existing CDM, where the units of production (eg credits) are typically developed by private organisations operating in developing countries, or;
- ii. A private sector company stimulated by Government contract, for example through a tendering system, although in this case, they may not have full control over production. An example of this is a road concession or a power plant built by private contractors in a developing country. Where this process is used, it must be transparent, not take too much time and ensure appropriate social and environmental safeguards. Or;
- iii. The national or sub-national Government establishes a state owned company to carry out production, for example as a result of a bilateral treaty. An example of this is national oil company (eg Petrobras in Brazil).

‘Not-for-profit’ examples:

- iv. An NGO or one or more local community groups. An example of this would be a school, orphanage, or not-for-profit credit entity in a developing country run by an NGO or local community group. Or;
- v. The Government, implemented by a Government department. An example of this is a state-run hospital or bank.

The specific complexities pertaining to this function are:

- The quality and frequency of independent assessment (auditing)
- Scalability of production activities and ability to measure and report the confidence of data.
- National and international incentives for quality implementation and management, including the predictability of support (financial and non-financial) and funding sustainability and source
- Firm commitment by national and local Governments, reflected in allocations in the national or sub-national budget and clear and catalytic government rules on

property rights, and business establishment procedures (eg as described by the World Bank Groups project “Doing business” assessments”⁷⁰)

- Clear national and international rules for engagement, eg development time, credit issuance, dispute resolution procedures and local community and other stakeholder engagement.
- Producer must be open to regulation and meet reporting requirements and should have due attention to co-benefits, in particular local livelihoods and indigenous communities rights, biodiversity and watersheds.

The different types of actors who could carry out this function affect the implementation time. Some of the consequences are described in Table 6.

There are a range of entities who could take on such a role now. In the long-term, a mix of these types of producers could easily be imagined. Producing entities could include carbon offset developers, private companies operating timber or agricultural concessions, NGOs such as Conservation International, or Governments such as the Republic of Indonesia.

This role specifically will be propagated and developed according to the international agreement and any additional national rules also dictated by market demands.

70. “The Doing Business project provides objective measures of business regulations and their enforcement across 183 economies and selected cities at the sub-national and regional level.” For more information please visit: <http://www.doingbusiness.org/>



Table 6:
Potential pros and cons of various producer types

Producer type	Potential pros	Potential cons
Private for-profit company	<ul style="list-style-type: none"> • Likely that the function will be carried out relatively quickly and efficiently • May be more transparent (eg more prone to pressure from international community, publishing of annual reports) 	<ul style="list-style-type: none"> • Will focus efforts on areas with biggest potential for returns (size of opportunity and ease of doing business)
Private for-profit company operating on a Government tender	<ul style="list-style-type: none"> • Can be incentivised to work relatively quickly • Government can pick best choice 	<ul style="list-style-type: none"> • Can only operate effectively when has strong and continued government support • May require a guarantee from a multilateral agency to do business in risky area • May be more open to corruption (eg kick-backs)
National government agency	<ul style="list-style-type: none"> • Government can control and coordinate all activities • Capacity is built up within the national Government 	<ul style="list-style-type: none"> • May be difficult for Government to secure funding from non-DFIs
Not for profit (NGOs, Multilateral and development agencies)	<ul style="list-style-type: none"> • May be seen as more trust worthy than private or Government agencies 	<ul style="list-style-type: none"> • Unlikely to be able to fund all activities through philanthropy, most have little experience of commercial activities (with some exceptions, eg the World Bank).

14. Measure and monitor



Measurement and estimation of carbon stocks at the implementation level is required in order to determine the activities' starting point or baseline (benchmark). Key implementation-level indicators and measurements need to be assessed over time (monitored) in order to infer progress towards meeting agreed targets. This must be reported to the national measurement and monitoring agency, so that a complete picture of national progress towards meeting the emission reduction target can be formed.

Measurement and monitoring information gathering at the implementation-level must follow certain guidelines and be of a minimum quality, set by the international management organisation and the national implementing agencies. This is to ensure that guidelines established by the international scientific advice body are adhered to (for example, if certain terrestrial carbon pools in land use sectors must be reported at the higher IPCC tiers⁷¹). Measurement and monitoring information gathered at the implementation-level can however be of a higher quality, gather additional information (eg on biodiversity), use more advanced or more expensive technology or methods and occur more frequently.

In non-Annex I countries this function is currently carried out by private producers, following the CDM approved methodologies which are based on IPCC guidance. In Annex I countries production-level measurement and monitoring is done by government agencies, typically the ministry responsible for environmental issues⁷². In terms of a potential system the function could be carried out by a government agency, and / or a private contractor hired by a sub-national government agency, and /or a private company.

71. For information on the IPCC tiers please see: "Good Practice Guidance for Land Use, Land Use Change and Forestry" 2003 – Edited by J. Penman, M. Gytarsky, T. Hirashi, T. Krug, D. Kruger, R. Pipatti, L. Buendia, K. Miwa, T. Ngara, K. Tanabe and F. Wagner. Published by the Institute for Global Environmental Strategies (IGES) for the IPCC. For a full list of IPCC publications please refer to: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.htm

72. For example, in Denmark, the Environmental Protection Agency collects and disseminates information on the environment. See: <http://www.mst.dk/Tvaergaende+indsats/Miljoedatabaser/>

15. Report



Public or private-sector entities implementing activities to reduce terrestrial carbon emissions or increase sequestration must report their activities to the national authority. This is required so that the national authority can determine national net emissions (or sequestrations) by sector or activity. Inherent to this is the maintenance of accounts.

The complexity of reporting by these implementation-level entities will depend on the level of decentralization. For example, in the case where national reporting is very centralized, the implementation agencies may report only their management activity, rather than an estimate of CO₂-equivalent emissions or reductions. In the context of a more decentralized national approach, the implementing entity may have to report their full carbon accounts, which would then be independently audited.

Under all circumstances, such reporting must be in a format that is decided by the national authority and that allows the national authority to compare activities and compile the overall national report. This function may also include the maintenance of reserve or buffers debited to balance the books in the event of production failures or catastrophic events.

There are various precedents for this function. According to the UNFCCC, all parties are required to report their Annex I countries are required to report steps they are taking to implement the Convention (Articles 4.1 and 12).

Annex I countries have been required to submit an annual inventory of their GHG emissions once a year since 1996. Annex I parties are also required to report using standardised reporting guidelines. Each report submitted by an Annex I party is reviewed by an international team of experts, comprised of both a desk and in-country study. Annex I parties must also submit annual GHG inventories. Annex I countries generate reported information from a variety of sources. For example, the UK National Inventory Report uses information from contracted sources (ie North Wyke Research provides estimated emissions for agriculture, and the Centre for Ecology and Hydrology (CEH) provides estimates on emissions from land use, land use change and forestry), official statistical centres (eg Department for Transport, British Geological Survey etc), other datasets (eg from the UK Petroleum Industry Association, Corus etc) and applies a variety of emission factors from the EU, US EPA and IPCC.⁷³

Each non-Annex I party must submit a national communication within three years of entry into force of the convention for the country – however, least developed countries may submit the report whenever their resources allow for it. Training for preparing the national communication report is provided to non-Annex I countries. More information about the reporting requirements can be found on the UNFCCC website.⁷⁴

Under current production processes in developing countries (ie the CDM), producers (project developers) must report their emissions and emission reductions (sequestration) in the standardized project design document (PDD), which is independently audited and submitted to the UNFCCC CDM

EB. Although the national entity (the DNA) is not required to compile a national report of all activities, it does receive information from these PDDs.

⁷³ Information on the UK GHG Inventory National System can be found at: <http://www.ghgi.org.uk/>

⁷⁴ The UNFCCC website: http://unfccc.int/national_reports/items/1408.php

16. Audit (verify and validate)



Implemented production activities must be independently audited to ensure that processes and results comply with national and international guidance. Specifically, that they achieve a minimum required standard set by the relevant international and national bodies and that the information is complete. Although some information is likely to be submitted annually (eg, that no unexpected outcomes have occurred during the year), this will require a thorough audit at least once per commitment period (five years) for REDD+ activities – although it may be different for non-forest AFOLU activities as these are more likely to undergo significant changes within a five year period. Field-based spot checks of production activities are also recommended.

There is precedence for implementation-level auditing in the current carbon market. CDM projects, ie those carried out in non-Annex I countries, must be audited twice by two different independent DOEs (See Box 5). Small-scale projects (below 15,000 CO₂-eq p.a.) only require auditing by one DOE. These DOEs are accredited by the UNFCCC.

This auditing process has been heavily criticized: auditors are paid by the sub-national entity (ie the project developer), the accreditation process of auditors is slow and cumbersome and existing DOEs are often stretched beyond their capacity.

In addition to being audited by a DOE, project activities under the CDM are also reviewed by the CDM Executive Board and are also open for review by the public.

Sub-national activities in the Annex I countries do not require auditing of this kind (there is no CDM in Annex 1 so no sub national activities of the type exist except in JI Track 2 – see Box 7).

Independent auditing is also common in the non-carbon sectors; ie auditing of food and hygiene standards, or in the process of attaining FSC certification.

Auditing of production may be carried out by a nationally-designated auditor (as per JI Track 1), or by an internationally-designated auditor (as per CDM and JI Track 2).

Currently, the only review carried out by national government of a non-Annex I country is in the context of issuance of a Letter of Approval (LOA). As these countries may be required to develop their own registries of (audited) activities and report net mitigation from the forestry sector, they may wish to have a greater role in the auditing process.

In the future, production reports may continue to be audited by an independent authority, and / or also by a government appointed entity. The primary requirement is that the auditor is truly independent and that the process is transparent and efficient.

17. License operators



To maximise the chances of effective operation in country and to protect all participants, having established the rules and minimum standards of operation (see “Set national plan”, Function 8), it is then necessary to ensure that producers are adhering to these standards, including to any national safeguards on the rights of local communities, biodiversity and watershed protection. This process is equivalent to an operating license for a power plant, or any licenses or approvals required by legal entities to operate in a country. This is, for example, related to existing business regulations which may impose additional restrictions or provide advantages to activities in certain sectors.⁷⁵

In essence, the function is to accept, approve and endorse activities and agents. The exact nature and scope of this process will be determined by the mechanism and rules set by each country and by the activity itself. It may be that some licenses will be issued on a project-by-project basis (ie production licenses, whether to private or public operators), and / or some on an entity basis (eg license to operate in a certain sector). In either case, the designated licensing authority will carry out an initial assessment, followed by regular review, and would have the power to suspend or revoke licenses where standards are no longer being met.

In the CDM, where there is no national liability for performance failure, licensing is carried out at the international level for the project activity, but additional operating licenses will be required at the country level depending on the activity⁷⁶.

Under the JI mechanism, licensing of the project activity may be carried out at the national or international level (see Box 7 for more details), with additional standard operating licenses required at the country level.

In this system where stronger national liability is envisaged, then licensing could be carried out largely by a Government mandated provider, potentially with international oversight and arbitration. Alternatively, licensing of producer activities could be carried out at the international level. It may be that a dual track system will be in operation, with national control for more advanced countries, and recourse to international provision for least advanced countries. In addition there may be a need for recourse to a national/ international arbitration system in case of dispute (see Functions 2 and 18).

75. For example, in the Lao People's Democratic Republic any business related to petroleum, electrical power, water utilities, telecommunications, wood and wood products, mines and minerals, food industry, medicine, chemical substances, liquor and tobacco must be closely controlled by the State and any license provided to a private entity may be heavily restricted, if granted at all. See Lao People Republic's Business Law (No. 005/94).

76. For example, a production activity involving A/R in Guyana would require obtaining the relevant approvals and licenses subject to the Land Registry Act (1998), the Land Settlement Act (1998) and other relevant land-related regulations.

18. Arbitrate



In any system which involves multiple agents with potentially competing interests and high rewards, there will be a need for independent adjudication between those agents on matters of dispute. That is, for an arbitrator with powers of enforcement.

In the case of arbitration between participants in country, the remit of this arbitrator might include disputes on the licensing of producers, auditing and registry of production activities, and the issuance of any economic incentives for production (eg carbon credits).

This national arbitrator will need to be mandated by, but independent of, the national government as national governments are both responsible for rule setting and oversight, and, as landowners, will also be key producers. For this reason, it may be desirable that this national arbitration function is overseen and supported by the international arbitrator, which could act as a “court of appeal” for matters of dispute in country unresolved by the national arbitration process (see “Arbitrate and enforce”, Function 3).

19. Measure and monitor



A country wishing to be a producer of terrestrial carbon sequestration or avoided emissions must measure and monitor its terrestrial carbon stocks in order to:

- Estimate initial terrestrial carbon stocks (sources and sinks), not least to inform the baseline or REL setting process (benchmarking)
- Understand the fluxes between the carbon pools, and to inform negotiations on an incentive scheme
- Monitor and estimate national progress towards meeting emission reduction targets and estimate performance against agreed baselines or RELs

In the end state, measurement and monitoring activities should take place at both the national oversight and at the implementation level. This is because relying solely on reports submitted by producers of mitigation will not provide adequate information to assess net mitigation at the national level, eg, the effects of policies and catastrophic events in areas outside of the areas of production. A national measurement and monitoring coordinating body would be responsible for carrying out or updating national terrestrial carbon measurement and monitoring assessments based on information from a variety of sources. In the UK for example, the Government's Greenhouse Gas Inventory assimilates national emission estimates for the agriculture and land use, land use change and forestry sectors developed by private contractors.⁷⁷

In developing countries, national measurement and monitoring of terrestrial carbon is patchy. Countries with greater capacity (eg Brazil, who use their national space agency INPE to monitor forest loss) and / or with a longer history of commercial forestry and countries receiving support from the FAO for their National Forest Monitoring and Assessment (NFMA) program may already have some infrastructure in place for national-level measurement and monitoring of terrestrial carbon.

Although some guidance does exist (eg from the IPCC), most countries are not required to carry out detailed national measurement and monitoring of terrestrial carbon. Additionally, although some international guidelines exist, they may be implemented differently in non-Annex I and Annex I countries⁷⁸, and even within Annex I countries. Existing measurement and monitoring assessments may also not always take into account data from production activities taking place at smaller implementation scales. However, current scientific methods are available to carry out compatible assessments of carbon emissions and reductions from the forest land use class.⁷⁹

The national measurement and monitoring function should reside under an appropriate national body (managed directly by the national government, or a designated national body), which should be coordinated with the national reporting body. This national body should, with other appropriate entities, recommend any measurement and monitoring and reporting guidelines additional to those provided by the international guidance body (Function 1) for producers. The information

submitted to the international management organisation should be consistent with the guidance set by the international guidance body and also be audited by an independent party.

77. For agriculture this is provided North Wyke Research (part of Rothamsted Research): www.northwyke.bbsrc.ac.uk. For land use, land use change and forestry this is provided by the Centre for Ecology and Hydrology: www.ceh.ac.uk

78. For a discussion of international guidelines and methods to measure and monitor please refer to Terrestrial Carbon Group Policy Brief 5: "Measuring and monitoring terrestrial carbon as part of "REDD+" MRV systems" and the accompanying background paper: "Measuring and monitoring terrestrial carbon". Available from: www.terrestrialcarbon.org

79. For a review of the scientific understanding of measurement and monitoring methods and abilities please refer to the forthcoming paper entitled "Research needs for AFOLU" by the Terrestrial Carbon Group.

20. Account



In essence, this function requires reconciling the overall performance in country as estimated by national level monitoring and measurement (see “Measure and monitor” Function 19) with that calculated from the audited reports of producers (see “Audit”, Function 16), and reporting the reconciled figures to the international community (“Report”, Function 22) for the purpose of monitoring global climate impacts, and monitoring performance against stated targets for credibility and review purposes.

An integral part of this will be maintaining and managing the books, including the national register (Function 21) and any national level reserves or buffers that may be debited to balance the books in the event of specific production failures and / or any national scale events eg forest fires. This Function is supplemented by management of the international register (Function 3) and any international reserves, to be drawn upon in the event of large scale reversals such as might arise from extensive forest fires or other national disasters. Such reserves might act to pool risks across all production activities. They could be credited from certified emissions reductions, a proportion of which would be held back from producers for this purpose.

Current precedents exist in the carbon market, for example the UK publishes its annual carbon account⁸⁰. Although rules exist as a result of the UNFCCC and Kyoto Protocol guidelines, Annex I countries in many cases have their own accounting systems. This has made comparability an issue, despite the fact that there are common reporting guidelines (see Function 22 below for more details). Other countries with a strong land use sector tend to have more advanced carbon accounting systems, eg Australia’s National Carbon Accounting System (NCAS)⁸¹, the US and Canada also have strong terrestrial carbon accounting systems.

A handful of developing countries are beginning to implement national accounting schemes for terrestrial carbon. One such example is the adaptation of the Australian NCAS system to Indonesia through the Indonesia-Australia Forest Carbon Partnership.⁸² This is complemented by the relevant ministries (see Table 3) as well as the World Agroforestry Center and is supported by multilateral organisations (eg UN-REDD Programme). Without solid measurement and monitoring facilities (Function 19), it may be difficult to develop high-quality national accounting schemes. In the interim these are likely to rely on production-level information (eg as a result of Functions 14, 15 and 16) and apply default factors recommended by the international guidance body (Function 1). However, this should eventually be taken on by a government entity, or a designated national body in the developing country.

83. This organisation is working with the Indonesian government to develop the program: Accountability and Local level initiative to reduce emissions from deforestation and degradation (ALLREDDI). See the following link for more information: <http://www.worldagroforestry.org/af2/node/115?q=node/200>

80. See the UK Department of Energy and Climate Change (DECC): <http://www.decc.gov.uk/en/content/cms/statistics/projections/projections.aspx>

81. For more information on the Australian NCAS please refer to: <http://www.climatechange.gov.au/government/initiatives/national-carbon-accounting.aspx>

82. See www.climatechange.gov.au

21. Manage national register



Producers must report their activities (Function 15) into a body managing a national register, so that country-level information can be prepared and reported (Function 22) and the status of national implementation assessed. The registry should be updated as often as material changes occur and reports are made by the various producers.

Information included in the national register would include:

- A list of activities to reduce GHG emissions or increase sequestration at the national level, and if applicable, by producer entities, and information on how much sequestration or avoided emissions has taken place (in CO₂-equivalent) and is planned
- The geographical location of the activities
- Information on the stakeholders (land owners, local communities etc.)
- Information on the ownership status of the activity
- If relevant, information on the number of carbon credits issued and the status of those credits (eg delivered, set aside for risk mitigation in case of project loss, etc.)

This register may also include information on the implementation of policies and measures, of other sector-wide activities.

This register would be used to manage national-level commitments, and help financiers or producers to understand the risks involved with production activities in the country.

At the very simplest level, it is a database a duplicate of which may be held by an international oversight body.

For countries with more capacity, devolved responsibility or a greater liability to manage, it can be used to mitigate risks (eg by developing a national buffer or a product set aside).

Producers in countries with little devolved responsibility or national capacity may receive approval to release incentives directly from an international body for proven mitigation.

In countries with greater national capacity, or who have taken on greater responsibility, the national government may use the national registry to issue any approval directly, provided that the resulting production is properly audited (see Functions 16 and 23).

The registry will likely be managed by an entity reporting to the national government (or in cases where the commitment has been devolved to the state-level, to the state). The operating platform, hosting system or framework may be managed by a private company. The hosting and information function (Function 26), which in a “market based system” may include an exchange or trading platform may have its own log of what is bought and sold. That log differs from this registry in that it logs trades on a day-to-day basis whereas this registry bestows

and subsequently logs certification status, which it may do only monthly or annually.

Fundamentally, the registry must be compliant with the requirements of the international agreement, so that the information contained in the registry is comparable between countries. It is therefore necessary under all situations that the registry only contains information that has been independently audited.

Precedents already exist in Annex-I countries (eg the UK Emissions Registry)⁸³, at the international level (the UNFCCC CDM Registry coordinated with national registries and transaction logs through the International Transaction Log)⁸⁴, and in the voluntary markets (eg the APX VCS Registry)⁸⁵.

84. <http://emissionsregistry.environment-agency.gov.uk/>

85. http://unfccc.int/kyoto_protocol/registry_systems/items/2723.php

86. “A secure web-based platform to create, verify, track, trade and retire Voluntary Carbon Units (VCUs).” <http://www.vcsregistry.com/>



In terms of reporting to the international community, it is necessary to report national-level progress with regards to meeting national commitments; if the agreed system includes sub-national or project-based activities, such activities may only be acceptable where there is a national REL/baseline. Such reporting should follow accepted guidelines (see “Provide guidance” Function 1), and be reported in a format that is easily comparable so that the impact of different activities in different geographical regions can be assessed. Reporting could for example, be required to be at a certain IPCC tier level⁸⁶, or follow any specific guidance imposed as a result of the agreement.

Reporting should be to the international oversight body (ie the international register (see Function 3). The international body which arbitrates and enforces the agreement may use reported information on which to base decisions (Function 2). National reports must be independently audited (Function 23), or, in the case of sub-national activities being reported, these must also be independently audited (Function 16) – both by licensed auditors (Function 4).

As any commitments and liabilities arising will likely be the responsibility of the national government, it would be logical that either the government itself or a government mandated body could carry out both the accounting (Function 20) and reporting functions. Alternatively, it could be carried out by an internationally mandated body in the event of capacity constraints in country.

A reporting system for Annex I and non-Annex I countries already exists under the UNFCCC and Kyoto Protocol. Annex I countries are required to submit periodic “National Communications” using the approved guidelines⁸⁷. Annex I countries are also required to report annual GHG inventories using the Common Reporting Format (CRF) and the National Inventory Report (NIR)⁸⁸. These are reviewed by expert review teams. There are still obstacles to be overcome with respect to comparability as reports submitted by Annex I countries are not yet fully analogous because not all countries report the same thing using the same mix of method and at the same IPCC quality tier.

Non-Annex I countries must submit only the periodic National Communications, and although these are reviewed, they are not done so in as much detail as for Annex I parties. Project activities in non-Annex I countries (see Box 5), and for “Track 2” JI activities in Annex I parties (see Box 7), are subject to a strict review procedure. It is likely that reporting requirements on non-Annex I parties will increase.

86. For information on IPCC guidance for national reporting please refer to: www.ipcc.ch

87. Current guidelines for the preparation of national communications (national communication #5) of Annex I parties can be found at: http://unfccc.int/national_reports/annex_i_natcom/_guidelines_for_ai_nat_comm/items/2707.php

88. More information on these can be found at: http://unfccc.int/national_reports/annex_i_ghg_inventories/reporting_requirements/items/2759.php

23. Audit (validation / verification)



The purpose of this function is to audit and verify the reports from national governments (or, from semi-autonomous states when they have targets). The audits would:

- Check that the activities comply with international and national requirements⁸⁹
- Identify and flag any issues with the national reports to the appropriate international oversight body
- Check that appropriate licenses are held for any purchases of emission reductions from other nations

These reports must be independently checked for consistency with international data sets gathered during international-level measurement and monitoring activities (Function 24) and also with existing verified national and sub-national data collected as a result of Functions 14 and 19). The audit and verification process will assist the international oversight body in the management of its registry, ie assigning risks and probabilities to the effectiveness of registered emission reduction activities. It will also enable the international oversight body to adjust emission reduction targets over time, ie by recommending adjustments to RELs or allowances.

To some extent, this function is already being carried out by the UNFCCC and Kyoto Protocol bodies which review national reports.

The national communications from Annex-I countries received by the UNFCCC are subject to in-depth reviews conducted by an international expert review team coordinated by the UNFCCC secretariat. This involves a desk based study and a country visit and aims to provide a “comprehensive, technical assessment of a Party’s implementation of its commitments.”⁹⁰ This also aids in the assessment of implementation of commitment activities by Annex I parties. The Kyoto Protocol requires Annex I parties to submit annual GHG inventories. The completeness, accuracy and adherence to guidelines are reviewed by expert review teams⁹¹. Each Annex I party is also subject to at least one in-country visit during each commitment period. The expert review team may recommend data adjustments if anomalies are found. The expert review team is mandated to recommend data adjustments and raise implementation issues with the UNFCCC Compliance Committee. Once the compliance procedures have been finalised, the compilation and accounting database is updated with a record of the Party’s emissions for that year.

Although non-Annex I country reports should follow approved reporting guidelines⁹², these are not independently audited. These are, however, examined by a “Consultative Group of Experts” (CGE), who also provide training in GHG inventory preparation, vulnerability and adaptation and mitigation assessments.⁹³

The auditor can be a public or private entity, ie an independent auditing company or a panel of experts under the supervision of the international management body⁹⁴. It is however fundamental that there are no conflicts of interest, and that the auditor is independent and reports to the international

management organisation. The auditor must also have the necessary capacity and skills to carry out the auditing.

This function must be reformed and expanded in the context of an international agreement, specifically, greater formalisation of the task is necessary. This would include coordination with the measurement and monitoring function, experts employed on a full-time basis and who review non-Annex I submissions as well as those from Annex I parties.

89. International requirements might be based on IPCC guidance (www.ipcc.ch), guidance provided by the UNFCCC and the Kyoto Protocol or its successor and project-specific methodologies. National requirements, in addition to standard operating licenses, might include other guidance eg related to biodiversity.

90. See: http://unfccc.int/national_reports/annex_i_natcom/idr_reports/items/2711.php

91. The purpose of the review is to “provide a comprehensive, technical assessment of a Party’s implementation of its commitments. The in-depth review results in an in-depth review report, which typically expands on and updates the national communication. The in-depth review reports aim to facilitate the work of the COP in assessing the implementation of commitments by Annex I Parties. The reports also allow easier comparison of information between the national communications of Parties, although no common indicators are employed.” See: http://unfccc.int/national_reports/annex_i_natcom/idr_reports/items/2711.php

92. For information on the guidelines and associated user manual please refer to: http://unfccc.int/national_reports/non-annex_i_natcom/guidelines_and_user_manual/items/2607.php

93. For information on Non-Annex I reporting under the UNFCCC please refer to: http://unfccc.int/national_reports/non-annex_i_natcom/items/2716.php

94. Annex I national reports are currently audited by an appointed group of experts coordinated by the UNFCCC secretariat; both desk-based and in-country reviews take place. For more information see: http://unfccc.int/national_reports/annex_i_natcom/idr_reports/items/2711.php

94. Annex I national reports are currently audited by an appointed group of experts coordinated by the UNFCCC secretariat; both desk-based and in-country reviews take place. For more information see: http://unfccc.int/national_reports/annex_i_natcom/idr_reports/items/2711.php

24. Measure and monitor



Measurement and monitoring is required at the international level to provide independent checks on the health of the climate and progress towards the emissions reduction target. It may also be used to verify national-level measurement and monitoring reports. The international measurement and monitoring reports can then be used to adjust national emission reduction targets, or allowances. These reports can also be used to set initial baselines or RELs and determine additionality, particularly in institutionally weak nations.

This measurement and monitoring should take place at the international level (eg, satellite and models of global land cover), but using reference national and sub-national verified data, including audited national and sub-national reports. Independent, specialised research institutions, including academic institutions, could contribute to, or participate in the development of measurement and monitoring reports.

Measurement and monitoring activities should be reported to the international governing body and be released to the public.

Several credible organisations exist which could be involved in international-level measurement and monitoring activities. These include the Global Terrestrial Observing System (GTOS), Global Observation of Forest and Land Cover Dynamics (GOFD-GOLD) and several programs run by academic institutions.⁹⁵ Input from national or regional agencies (eg NASA, the European Joint Research Commission etc.) should also be considered, including data compiled from audited national and production reports. It is therefore critical that reports provide data in a format where it is comparable, and can be reviewed in the context of global GHG assessments. Any international-level measurement and monitoring activities should also be closely linked with the IPCC.

95. The Terrestrial Carbon Group is currently carrying out an assessment of the state of the science of AFOLU. This includes an assessment of measurement and monitoring methods at various scales and for the different land use classes and also contains a review of “who is doing what” in terms of measuring and monitoring terrestrial carbon. For more information please see: “Research needs for AFOLU” which will be made available at www.terrestrialcarbon.org

25. Aggregate production (sellers)



Producers will range from small scale 'farmers' to local and national governments to large scale multi-national corporations. Similarly, consumers will range from small companies to local and national governments to large scale multi-national corporations.

The role of an aggregator of producers is to provide an intermediary link in the distribution chain and act as a single agent for multiple producers, negotiating and marketing for them as one bloc. There are many rationales for this:

- To ease market access and increase market power for smaller producers.
- To lower overheads
- To pool risks and rewards
- To facilitate an alternative revenue distribution mechanism
- To attract buyers who want to buy at scale, without making deals with a potentially large number of suppliers

N.B. As shown below, these rationales all have meaning regardless

of whether countries are implementing bilateral trades, receiving payments from international funds or engaging within a compliance market. Further, this function has many precedents. Two examples from the wheat trade are given above (see Box 4), and there are many examples of voluntary co-operative systems in a wide variety of commodity trading processes.

As noted, these aggregators typically act as a single marketer on behalf of producers. However, the extent of the mandate, operational practice and governance structure can vary considerably to meet different needs and demands. The key flexibilities, and options under different system designs, are described in Table 7.

In the context of this system, we believe there is a potential role for an aggregator function.

We are already seeing such functions being carried out at the national level in a mandatory capacity, for example in the Brazilian Sustainable Amazon Plan (see Box 1). Further, it is worth noting that even in the absence of government provision it is common for voluntary, self-regulating producer co-operatives to be created to fulfil this function.

Table 7:
Flexibilities in aggregator function

Flexibility	Options	Impact	Applicability to different system
Degree of price control	Role might include setting common prices over time and/ or across participating producers, giving guarantees over the volume of production it will purchase, and/ or smoothing the timing of payment flows	Pools risks and rewards to reduce risk for individual producers, increasing price stability and surety Impacts i) degree of operational efficiency, ii) the level of representation from participating parties and iii) the degree of market power attained by producers.	
Level of operation	May be carried out at the local, national and/ or international level.		Arguably necessary at national level for countries engaging in bilateral trades or national/ international level if multi-lateral funding. For countries engaging in international REDD agreement, could be at implementation or national level, or neither.
Degree of participation (amongst individual producers in country)	Mandatory or voluntary participation	Trade off here – the smaller the number of participants, the smaller the potential benefits of the aggregator. However, more powerful operators may want to opt out as may be able to get a better price marketing independently	Arguably mandatory for countries engaging in bilateral trades or national/ international level if multi-lateral funding, as means to control disbursement of funds.
Who does it	Public institutions, private institutions (with a government mandate if participation is compulsory) or co-operatives of producers. This can be one or many aggregators	May influence opportunity for, and likelihood of, alternative revenue sharing mechanisms and possible cross-subsidisation of other activities Possible for a number of aggregators to co-exist. While greater aggregation suggests higher potential benefits, competition can bring efficiency and it also reduces the risk of abuse of monopsony power. If only one, need controls and checks to limit abuse of power.	If producer participation is compulsory, then it would seem appropriate that all operatives have a government mandate. If provision is via a government body, then it would seem appropriate that its governance structure includes producer advisory bodies.

26. Hosting and information



The purpose of this function is to host or provide a platform for the transaction space in order to exchange carbon credits associated with GHG emission reduction or sequestration (eg offsets, allowances etc.). It may also provide a platform for the listing of organisations or products (eg companies or funds) but this particular function relates to carbon credits specifically. This function is therefore only required where compliance grade credits are traded in an offset market.

As this function provides the platform, it also provides the natural point for providing market information, including on volumes traded and prices. Information services related to this function include information dissemination, market analytics, indexes and market data. As a result, it also helps to provide liquidity to the market, and can facilitate the creation of derivatives and / or market linked risk-mitigation strategies, such as hedging.

The hosting function is usually made up of an electronic trading platform, and is tied to the registry and clearing house functions. The function can provide the service to the global market, a national market or a specific segment or segments of the market (eg only CERs). It is the duty of the actor of this function to provide efficient, transparent and orderly trading environments, they may or may not also carry out the settlement of the resulting trades (“Process and log transactions”, also called “clearing” – see Function 27).

There are several examples of this function, both in traditional and carbon markets.

In the traditional sense, this function provides a place for buyers and sellers to interact (exchange). This is typically combined with a central registry. The initial offering of the product on the exchange is carried out in what is known as the “primary market” and subsequent trading in the “secondary market”. Trades that are not done on the exchange are labelled as “Over-The-Counter” (OTC). Physical commodities such as agricultural products cannot be bought or sold over electronic markets, so it is the contracts tied to the supply or purchase of these commodities that are exchanged. The types of contracts can include spot prices, forwards, futures and options on futures, other instruments might include interest rates, swaps or contracts related to transport (eg ocean freight).

There are currently several exchanges where carbon credits are bought and sold (eg, European Climate Exchange, OMX Nordic Exchange, Eurex, EXAA, Bluenext, Climex, Climate Spot Exchange, Chicago Climate Exchange (CCX), Brazil Mercantile Futures Exchange, Multi Commodities Exchange of India (MCX), Hong Kong Stock Exchange (HKEx), Asia Carbon Exchange, etc.). Global markets trade primary or secondary CERs.

The trading of carbon credits is similar to agricultural commodities in that it is not really the physical commodity that is traded, but rather the contracts related to it. It is therefore important to ensure that the credit is actually tied to a “real thing” and that it will be delivered at some point. Complexity is increased when there are many different types of credits. As with carbon, a plethora of credits already exist (eg CERs, EUAs, AAUs,

and VERs etc.) accompanied by a range of financial instruments (futures, forwards, indices and structured products for the most liquid instruments EUAs and CERs). However, this segmentation across credit types and also a lack of fungibility across exchanges increases complexity and can reduce the liquidity and usefulness of this function.

This function already exists in the current carbon markets. It is expected that this function will continue to develop as and when Function 6 “Set market rules” is established and when there is sufficient demand from participants to warrant the further development of this function to meet specific needs of transacting terrestrial carbon products.

27. Process and log transactions



This function may be provided together with the hosting and information function described above (Function 26). It is a function required only in the case of a market-based solution.

The purpose of this function may be to simply process and log transactions (eg in the case of the International Transaction Log, or ITL, of the UNFCCC), or, in more advanced models to act as counterparty to every trade, and extend guarantees that the trade will be settled as originally intended (“novation”). The consequence of a more advanced structure is that those who are trading take no risk on the actual counterparty to the trade, but on the clearing corporation, for example that the counterparty risk is taken on by a bank or some other intermediary who carry out the due diligence and collect the product or money. This function may therefore provide a risk-mitigation role for private (and also public) sector market participants. A more advanced clearing house role could carry out this role by holding deposits to trade (margins).

This function is common and established both in carbon and non-carbon markets. An example of this is the Japan Commodity Clearing House (JCCH) and the London Clearing House (LCH.Clearent). Carbon-credit exchanges also use clearing houses, eg ECX uses ICE as its clearing house.

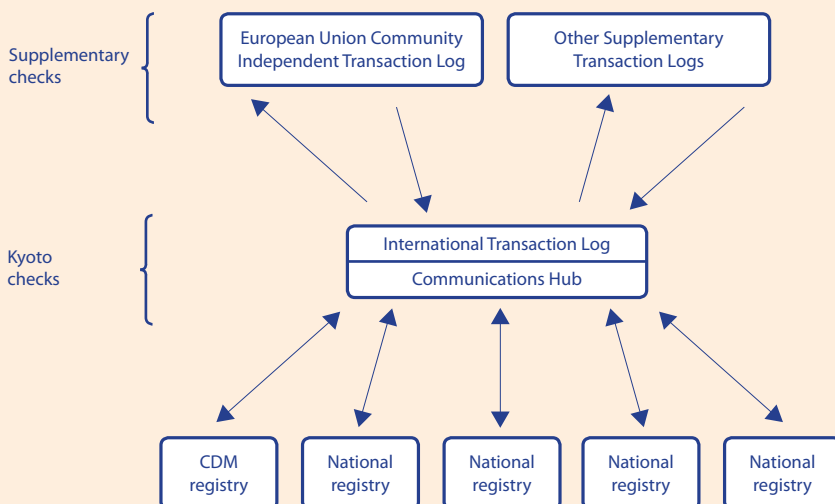
Figure 7 below illustrates how the current carbon market works at the centralised international level. The ITL audits transactions proposed by registries to ensure they are consistent with rules agreed under the Kyoto Protocol. The ITL receives proposals for transactions from various registries, checks these and provides its approval (or rejection) to the registry. Once this has been approved, registries complete the transaction. This is governed by Data Exchange Standards which define the technical requirements for the communication between the ITL and registry.⁹⁶

In the case of an international emissions trading market, both the formal, centralised log (eg the ITL) and private-sector logs (eg ECX) can co-exist as long as the centralized body has enough information to conduct annual assessments of the status of parties with commitments under an agreement. This function is already well established in today’s carbon markets. It is likely to develop further to meet specific needs of the terrestrial carbon product as market rules are set (Function 6).

⁹⁶. For more information on the ITL please refer to: http://unfccc.int/kyoto_protocol/registry_systems/itl/items/4065.php

⁹⁷. http://unfccc.int/kyoto_protocol/registry_systems/items/2723.php

Figure 7:
*Registry systems under the Kyoto Protocol*⁹⁷



28. “Regulate” market



Although the entire system will be regulated by the international oversight and national oversight bodies, the international community, individual countries or groups of countries may wish to create or mandate a market regulator which would effectively take on some of the roles of a traditional central bank.

In the case of an international fund (eg an aggregator on the production (Function 25) or consumption side (Function 29)), the fund may also wholly or in part regulate the market by controlling the release of money and / or the product. In particular, it could have the authority to regulate the number and carbon credits in circulation (and thereby manipulate the price) by buying or selling credits. It could also take on some of the traditional roles of a financial services regulator, eg the UK FSA, if it had authority to control and monitor carbon markets. Such a regulator would need to be accountable to the international oversight body, and/or national bodies for the markets that it represents.

The roles that the regulator could take on include:

- Open market operations to regulate carbon credit supply and price
- Set standards for margin requirements for trades
- Increase public awareness and understanding of the market
- Protect market participants by reducing volatility and assisting in the enforcement of rules (eg with Function 2)

There are precedents for such a function within the traditional financial markets and carbon markets in the context of national regulations set by Annex I governments.

For example both the EU ETS and the RGGI are examples of more decentralised models where individual states agree to a set of market regulations but these are managed largely within the member states or countries. A more centralised and actively managed example of this function could be a central bank, such as the European Central Bank, which is tasked with defining and implementing the monetary policy of the Eurozone.

An International Emissions Trading Association (IETA) currently exists and this body could provide input and support to the development of a body to set rules for an international market. There are some signals that the various markets are moving towards better coordination, through for example the International Carbon Action Partnership (ICAP) which provides a forum for sharing experiences with carbon markets, with the ultimate aim of fostering the linkage of current and emerging carbon markets.⁹⁸

Given the nature of the organisations responsibilities, ie regulation of private enterprise, it would however, for issues of neutrality, be most appropriate for the function to be carried out by a centralized, independent multinational institution or body. The extent of the power of the entity carrying out this function

must be decided by the international and national oversight bodies (eg in conjunction with Function 6 “Set market rules”).

98. The ICAP is a forum working towards the harmonization and future linkage of carbon trading schemes. ICAP includes member from the European Union, RGGI, Western Climate Initiative (WCI) as well as Australia, New Zealand, Norway and the Tokyo Metropolitan Government. For more information see: www.icapcarbonaction.com

29. Aggregate consumption (buyers)



Consumers will range from small companies to local and national governments to large scale multi-national corporations, and producers will range from small scale 'farmers' to local and national governments to large scale multi-national corporations.

Like the aggregator of producers, the role of an aggregator of consumers is to provide an intermediary link in the distribution chain and act as a single agent for multiple consumers, negotiating and marketing for them as one bloc. Rationales for this include:

- To ease market access and increase market power. This includes the potential for such arrangements as reverse auctions to lower purchase costs.
- To lower overheads.
- To pool risks and rewards.
- To attract sellers who want to sell at scale, without making deals with a potentially large number of purchasers.

These rationales all have meaning regardless of whether countries are implementing bilateral trades, multi-lateral arrangements or engaging with a compliance market.

The extent of the mandate, operational practice and governance structure can vary considerably to meet different needs and demands. The key flexibilities and options under different system designs include: the degree of price control, the level of operation (sub-national, national and/ or international), the degree of participation (mandatory or voluntary) and the institution(s) mandated to perform this function.

For more detail on the potential role of an aggregator, see also "Aggregate production (sellers)" Function 25.

30. Treasury



Regarding financing the changes required and incentivising and rewarding performance, monies might come directly from the private sector or from the public sector, (eg, from national treasury coffers, specific carbon or other taxes, or revenue raised from the auctioning of allocated allowance units or similar).

In terms of monies for readiness, capacity building and early action, it is more likely that this will come primarily from the public sector.

Therefore, there is a need for a treasury function in country to determine the rules and enforcement system to raise, collect and manage monies from these various sources. This is complicated slightly if monies are raised by a market linked mechanism where the market is 'cross border' eg the EU ETS, but the same need applies.

This function will need to be carried out by a government agency with strong links to all relevant ministries and government departments. It will need to link to any aggregator or other transacting institution as needed by the specific operating model.

31. Report



In terms of reporting to the international community, it is necessary to report national-level progress with regards to meeting national commitments. On the consumption side, the reporting of national greenhouse gas inventories and progress towards emission reduction targets will be a factor in determining demand for the product (as well as the market rules, see Function 6) – in other words they will be a factor in deciding on the caps for the following period as well as specific national allocations.

Reporting should follow accepted guidelines (see “Provide guidance” Function 1), and be reported in a format that is easily comparable so that the impact of different activities in different geographical regions can be assessed. Reporting should be to the international oversight body (ie the international register (see Function 3)). The international body which arbitrates and enforces the agreement may use reported information on which to base decisions (Function 2). National reports must be independently audited (Function 23).

As any liability arising from discrepancies will likely be the responsibility of the national government, it would seem that either the government itself or a government mandated body carry out both the accounting (Function 20) and reporting functions. In most Annex I countries, reporting is the responsibility of a government ministry.

A reporting system for Annex I countries already exists under the UNFCCC and Kyoto Protocol. Annex I countries are required to submit periodic ‘National Communications’ using the approved guidelines⁹⁹. Annex I countries are also required to report annual GHG inventories using the Common Reporting Format (CRF) and the National Inventory Report (NIR).¹⁰⁰ These are reviewed by expert review teams (see Function 23). There are still obstacles to be overcome with respect to comparability as reports submitted by Annex I countries are not yet fully analogous because not all countries report the same thing using the same mix of method and at the same IPCC quality tier.

As it is the nation states or, in some exceptional cases, independent states, that have commitments, reporting of emissions and sequestrations will have to be done by a government agency or a designated national body with the cooperation of the national accounting (Function 20) and measurement and monitoring body (see Function 19).

99. Current guidelines for the preparation of national communications (national communication #5) of Annex I parties can be found at: http://unfccc.int/national_reports/annex_i_natcom/_guidelines_for_ai_nat_comm/items/2707.php

100. More information on these can be found at: http://unfccc.int/national_reports/annex_i_ghg_inventories/reporting_requirements/items/2759.php

