

National REDD+ Registries



AN OVERVIEW OF ISSUES AND DESIGN OPTIONS

In cooperation with:



On behalf of:



Federal Ministry
for Economic Cooperation
and Development



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Executive Summary



Background

REDD+ financing through the Forest Carbon Partnership Facility (FCPF), the UN-REDD Programme, and bilateral initiatives intends to build readiness capacity, and explore ways to fund forest carbon emission reductions through results-based payments for emission reduction programs (ERPs) that form part of a national REDD+ strategy. This public finance could be complemented by private sector initiatives to fund discrete ERPs that could generate emission reductions. ERPs may be national in scope, but many will likely have geographic boundaries set below the national level. Before countries adopt national reference levels, and likely once national reference levels are established, a mechanism is needed to track and validate subnational results-based actions, including payments and crediting (if allowed), by subnational ERPs. Tracking and validation is essential to ensure

environmental integrity across different REDD+ initiatives and promote transparency and appropriate benefit sharing with stakeholders.

To date there is little practical experience illustrating how subnational or project ERPs can be integrated into national accounting. REDD+ registries could be an important tool to centrally record the information necessary to address these issues and facilitate transparency and tracking of that information. REDD+ registries could ensure important information is captured, processed and stored in a consolidated, transparent, and easy-to-interpret manner. Centralized information storage and access could help to manage implementation of ERPs, results-based funding, private investment, and potentially REDD+ carbon markets if a market-based mechanism is used.

Key Requirements of a National REDD+ Registry

According to our research and consultations, a national REDD+ registry has to ensure environmental integrity, transparency, and efficiency. Environmental integrity can be achieved by (i) the policy or standard that sets the eligibility requirements for a bona fide ERP, and (ii) recording and tracking ERPs, emission reductions, and REDD+ units or results-based payments. A registry can both track double counting and domestic leakage. Regarding transparency, details of ERPs, REDD+ units, regional and/or national reference scenarios could be recorded in the registry to promote transparency. A REDD+ registry should be managed in a financially and operationally efficient manner.

Among our interviewees there was general agreement that a registry could evolve and become more sophisticated over time in response to national and international requirements and national capabilities. Most interviewees agreed that national REDD+ registries should eventually – once an international REDD+ mechanism has been established – adhere to a mixture of internationally agreed policy requirements and additional domestic requirements. The compliance with international rules may reflect a phased approach of increasingly sophisticated international and domestic requirements as a country's national REDD+ strategy, its MRV capabilities, and the international financial mechanism(s) for REDD+ evolve.

Registry Value and Functions

Registries can help ensure confidence, integrity, transparency, and efficiency of information relating to ERPs, and any units and payments issued for them. When designing REDD+ incentives, financing mechanisms and payment-based programs, registries will play a key role ensuring that important

information is captured, processed, stored, and accessible when required. This will help promote the credibility of REDD+ actions and ensure that there is one aggregated and centralized repository of information to record and disclose this information.

In a REDD+ context, regardless of whether a market-based mechanism is established, a registry can aggregate and track multiple levels of ERP activity (national, subnational and project-based) and can provide governments and donors with transparent and meaningful data from which to make results-based payments. For the purposes of this report, the term "registry" therefore refers to the electronic infrastructure designed specifically to ensure accurate accounting of ERPs and their respective performance (measured either through emission reductions or removals, or another agreed performance metric) as well as the issuance of REDD+ units or the recording of results-based payments, irrespective of whether the units are transacting within a market framework.

However, where the jurisdiction in which the ERPs operate supports a marketplace for REDD+ units, then the rationale for a properly designed registry is even stronger. Establishing clarity around the nature and ownership of any asset is critical to enable it to transact a performance payment efficiently and with confidence. Registries currently provide this function in local and global markets all over the world and are increasingly used in a number of other emerging environmental markets such as water quality markets or biodiversity offsetting. Environmental payment-based programs in existence that do not use registry infrastructure have suffered from a lack of transparency.

A REDD+ registry could be created as part of a broader national REDD+ strategy and would ideally be placed in the context of the legal and institutional framework estab-

lished to govern and oversee the implementation of the REDD+ program(s). In order to promote participation and access, the procedures and guidelines for the operation of the REDD+ registry should be based on simple, transparent, and expeditious rules. Issues to be dealt with through these guidelines and procedures may include: (i) relevant institutional arrangements for the operation of the registry; (ii) verification of information and approval procedures; (iii) authorized participants; and (iv) effect on title and rights to REDD+ benefits.

Options to finance national REDD+ registry infrastructure whilst ensuring quality design and use could include (i) national donors and governments grouping funds to finance extension/set-up and ongoing operation and maintenance of existing infrastructure in certain jurisdictions for a period of time so that users were insulated from costs initially; (ii) volume-based charges to national governments; and (iii) volume-based charges to users.

Compliance market registries

The largest global compliance carbon market activity is founded on the basis of the Kyoto Protocol and comprises a network of national registries and one central "international transaction log" (ITL) operated by the UNFCCC Secretariat. The Kyoto registry system currently operates in a manner that ensures environmental integrity by accurate tracking and holding of Kyoto units. Annex I registries are managed by the individual countries and are designed to carry the following transaction types: issuance, transfer, acquisition, cancellation, replacement, retirement, and carry-over of Kyoto units. Issuance may include issuance of new units such as Removal Units or conversion of one type of unit (e.g. an AAU) into another type of unit (e.g. an ERU for a JI project). This conversion for ERUs effectively stops double counting in JI projects that are necessarily



included in the national reporting and inventories. These national registries are required to interact electronically with the UNFCCC ITL, which validates requested activities on the network and communicates across the registry system.

Voluntary market registries

The voluntary carbon market contains a number of different carbon offset accounting standards all with differing rules, infrastructure requirements and in most cases without any overarching standards body actively approving issuance and treatment of the units created. Most major standards are linked with a third party registry provider and some standards authorities (such as the Voluntary Carbon Standard Association (VCSA) or The Gold Standard) have established a very structured approach to registry operations including drafting operating procedures and audit requirements. Other standards authorities are less involved in the registry functions and procedures. There is a measurable trend towards registry usage in the voluntary carbon market given the confidence, transparency, efficiency and credibility that registry use helps deliver to sellers and buyers in that market (particu-

larly in the absence of a compliance framework underpinning these standards).

Registry infrastructure

At the operational level, a registry is essentially infrastructure comprising (i) technology; (ii) rules; and (iii) operational processes. Users open accounts, hold "currencies" (in this case, various forms of units) and communicate with a central operations body or system regarding movement of those units. However, the compliance carbon market registry infrastructure, being underpinned by an international agreement, has, by necessity, stronger inter-connectivity than voluntary carbon market registry infrastructure. It is important to note at the outset that registry technology is essentially database driven and is not particularly complex to implement if designed correctly from the start. Clear policy considerations and government/finance requirements are the complex elements.

National REDD+ Registry Design Options

If designed properly, REDD+ registries can be useful tools to ensure transparency and increased efficiency in REDD+ programs and assist with risk management for all participants. As such registries are an important element of the national REDD+ architecture. Responding to the evolving nature of a REDD+ mechanism and to the different national circumstances and capabilities of REDD+ countries, a national REDD+ registry can be implemented in phases.

Potential REDD+ registry phases

Taking into account the emerging nature of a REDD+ mechanism, the initially limited number of ERPs, and the evolving institutional capacities around REDD+ readiness

and implementation, countries may wish to start by implementing a national REDD+ registry to simply capture core information for each discrete ERP and track the activity and its performance within the registry (i.e. ERP Tracking). Performance can be measured either in tonnes of CO₂e reduced or removed, or through other metrics or proxies.

As national MRV capacities grow and a national reference level is adopted, the various reference levels (national, regional, subnational) can be consolidated and the outcomes of ERPs could be recorded and their respective REDD+ units issued and/or results-based payments tracked by the registry (Issuance and Unit Tracking).

Finally, as REDD+ markets evolve more fully, and if a country opts to either establish a national market in REDD+ units or through a link with international or other national registries, countries may opt to expand their use of the registry infrastructure by utilizing additional functionality and participate in international REDD+ markets (Trade Registry).

Potential REDD+ registry design features:

- A REDD+ registry should avoid double counting. Double counting can happen either through a double counting of emission reductions from the same area of forest by two different ERPs, or through the double counting of the same emission reduction at the subnational, and regional, or national level.
- Registries should ensure accountability. This includes operational processes and checks, whether units are eligible to meet any regulatory obligations, and serialization of units. A serial number for a REDD+ unit must be unique, but also enable holders to access key information about the underlying

environmental benefit that the unit represents. Serial numbers for REDD+ units can be concatenated and contain a lot more information at the serial number level than financial product serial numbers.

- Registries should be efficient. This includes determining levels of access to a registry (users with registered ERPs and units, the public, and registry administrators), linkages across registries (via data exchange standards), document management, and reporting and auditability.

- A REDD+ registry could further record and provide information to help consolidate various levels of accuracy. Reference scenarios may be established at the subnational, regional, and national level. These reference scenarios may be geographically explicit (i.e. identify different rates of deforestation within their bounds, such as non-threatened areas and deforestation or degradation "hot spots"). The different levels of reference scenarios should be consistent.

- A REDD+ registry could also support a number of policy options to address a situation where national emissions exceed a national reference scenario. A registry could be extended to record each country's emissions levels and therefore any emissions that occurred over the national reference scenario. This number would in effect be recorded in a negative account. Alternatively, a registry could contain a national buffer / reserve account that could be drawn upon if national emissions exceed the national reference scenario. This buffer account would be filled from a percentage of units issued. A third option is the cancellation or voidance of already issued units in an amount that corresponds to the deficit. A fourth and related option is periodic expiration of units, which are only re-issued if the performance is maintained. If subnational ERPs are issued REDD+ units and incorporated into a regional or national reference scenario, there is a risk that more units will

be claimed by subnational activities than available based on the results of regional or national MRV. REDD+ policy will need to state how this is addressed, and may include reviews of subnational ERPs that claim successful performance to assess the accuracy of these claims. A registry can perform a number of functions that would be set by policy to address the implications this has on performing subnational activities.

- A REDD+ registry can track safeguard compliance and co-benefits. A registry can track non-GHG related ERP features such as compliance with benefit-sharing arrangements (when these are precisely defined in national rules or under the chosen standard or international program), with procedures for local communities' involvement and participation in ERPs, and with any specific requirements applicable for ERPs taking place in indigenous lands

- A REDD+ registry can play a role in early action activities by compiling information and grandfathering early action efforts. REDD+ efforts carried out before the formal establishment of a national REDD+ accounting framework are normally referred to as early action efforts. Developing countries supporting the implementation of REDD+ at the national (as well as subnational) level may wish to set-up an incentive structure to promote early action during an interim-phase. The main objective of these early incentives is to attract local governmental and non-governmental actors to participate in REDD+ activities to develop experience, test new concepts, increase private sector interest, and allow for prompt delivery of real and measurable emissions reductions (and removals).

- A REDD+ Registry could also be a tool to register quotas assigned to carbon rightholders under a centralized national approach, thus, serving effectively as a "benefit sharing mechanism."

Introduction



Background

REDD+ financing through the UNFCCC, Forest Carbon Partnership Facility (FCPF), the UN-REDD Programme, and bilateral initiatives, intends to build readiness capacity, and explore ways to fund forest carbon emission reductions through results-based payments for emission reduction programs (ERPs) that form part of a national REDD+ strategy that many countries are developing. This public finance could be complemented by private sector initiatives to fund discrete ERPs that could generate emission reductions. ERPs may be national in scope, but many will likely have geographic boundaries set below the national level.

While results-based funding could involve payments for ERPs operating at the subnational level as an interim measure, a REDD+ mechanism will ultimately operate at the national scale and account for emission reductions against a national reference level.¹

Before countries adopt national reference levels, and likely once national reference levels are established, a mechanism is needed to track and validate subnational results-based actions, including payments and crediting (if allowed), by subnational ERPs. Even for purely national approaches, national REDD+ registries can play an important role as a tool for transparent distribution of benefits from national emission reductions. A similar type of distribution of emission rights already occurs in Europe for individual industrial emitters under a national cap of the Kyoto Protocol. Tracking and validation is essential to ensure environmental integrity across different REDD+ initiatives and promote transparency and appropriate benefit sharing with stakeholders. Ensuring environmental integrity, transparency, and benefit sharing in turn raises a host of additional issues, including inter alia, accuracy in measurement, reporting and verification (MRV), accuracy and consistency across national and subnational scales, overlapping (and potentially inconsistent)

¹ See the decision from COP16 in Cancun Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention, paragraphs 71 and 73 on subnational activities as an interim measure and results-based actions.

subnational reference scenarios or ERPs, double counting, domestic leakage, ERP approval procedures, allocation of subnational carbon rights and rights to benefits within a national allotment, and risk management associated with national shortfalls.

To date there is little practical experience illustrating how subnational or project ERPs can be integrated into national accounting to address the above issues. REDD+ registries could be an important tool to centrally record the information necessary to address these issues and facilitate transparency and tracking of that information. REDD+ registries could ensure important information is captured, processed, and stored in a consolidated, transparent, and easy-to-interpret manner. Centralized information storage and access could help to manage implementation of ERPs, results-based funding, private investment and potentially REDD+ carbon markets if a market-based mechanism is used.

Objectives

KfW Bankengruppe, on behalf of the German Federal Ministry for Economic Cooperation and Development, and in close cooperation with the Facility Management Team (FMT) of the Forest Carbon Partnership Facility (FCPF), awarded a contract to Climate Focus and Markit to prepare an analysis of options for national REDD+ registries. The objectives of the analysis are:

- Clarify the rationale, function, and operations of a national REDD+ registry in the context of requirements of REDD+ countries.
- Identify design options for a REDD+ registry that consolidates results-based financing and tracking of sub-national ERPs under a national REDD+ strategy.
- Contribute to knowledge around integration of subnational ERPs within national

approaches to meet the needs of REDD+ countries, investors, donors, and financiers.

Methodology and contributors

The analysis was conducted via a combination of personal experience of the authors, desk review of literature, and interview. Drafts were commented on by a number of experts and presented at a workshop held in Frankfurt, Germany in February 2011.

We would like to acknowledge the contributions of the following people: Agustin Silvani, Anna Lehman, Alfred Gichu, Andreas Dahl-Jørgensen, Barbara Bamberger, Björn Hecht, Christian Grossheim, Frédéric Dinguirard, Gillian Tong, Hermine Kleymann, Joachim Gottschalk, Karl-Heinz Stecher, Kristin Gerber, Lars Schmidt, Lucio Santos, Maria J. Sanz-Sanchez, Martin Schröder, Michael Hüttner, Nils Meyer, Peter Hilliges, Reinhard Wolf, Stefan EBel, Tobias Wittmann, Warwick Manfrinato and Werner Kornexl.

Limitations and Assumptions

REDD was expanded during the 2009 negotiations in Copenhagen at COP-15 to account for conservation, sustainable management of forests, and enhancement of forest carbon stocks – referred to now as REDD+. A share of fast-track funding has been reserved for REDD+ in addition to a number of dedicated international funds. Through the expanded scope of REDD, a future REDD+ mechanism will de facto cover all forest sector activities in participating countries. It is acknowledged that activities in the area of conservation and enhancement of forest carbon stock may require particular considerations that go beyond those elaborated on in this study.

The objective of the analysis is to elaborate on design options and functionality of national REDD+ registries. At the time of writing an international REDD+ mechanism

has not yet been established. Rules and procedures guiding the establishment of such mechanism are limited to decisions taken by the Parties to the UN Framework Convention on Climate Change (UNFCCC) from 2005-2009. Decisions on whether REDD+ should be funded via international carbon markets or linked to entity-level emission trading schemes are still outstanding. Similarly, the treatment of sub-national ERPs and accounting frameworks within the context of the UNFCCC is not yet decided. The current analysis does not attempt to pre-empt any decision by UNFCCC Parties nor by national governments that have the sovereign authority to decide on the implementation modalities for REDD+ in their respective countries. The objective of this report is to help inform the countries that participate in the FCPF, UN-REDD Programme, and bilateral initiatives to record and track REDD+ actions at the subnational level.

REDD+ registries can play a key role in supporting REDD+ activities by tracking ERPs and serving as the basis for initiating and tracking results-based payments from such programs. They can play this role irrespective of whether market or non-market funding is used. Once existing registry infrastructure is upgraded to support ERP tracking and results-based payments, each country and its partners will have the flexibility to access the functionality they require depending on the stage of the national and international policies and their REDD+ activities. While we try to avoid pre-supposing any policy decisions on the details, a thorough analysis of all REDD+ policy options and how a national REDD+ registry may support (or fail to support) these policy options is unfortunately beyond the scope of this introductory paper. However, in order to discuss national REDD+ registries a policy context is unavoidable. We therefore discuss general non-market approaches to REDD+ along with more detailed discussions based on the assumption of market-based funding, the linkage of REDD+ to international or national market

mechanisms, and the entity-level trading of REDD+ units.

Finally, a national REDD+ registry contemplated in this report is different to the international registry for Nationally Appropriate Mitigation Actions (known as NAMAs). While there may be a number of functional similarities, and parties to the UNFCCC could choose to make linkages between REDD+ and NAMAs, this report is silent on this and any reference to national REDD+ registries should not be read to imply any inherent or implied connection to a NAMA registry.

Report Organization

The report is organized into 4 sections. The first section is the introduction. The second section summarizes the findings of a number of interviews conducted to identify key features that a registry should contain. The third section introduces registries in general, explaining the value and basic infrastructure. Section 4 goes into more detail on national REDD+ registries, exploring different options for designing national REDD+ registries.

Definitions

REDD+ is a very political subject and marked-

ly different meanings and interpretations are often attributed to specific terms or phrases. This report attempts to remain as politically neutral as possible whilst still discussing key issues that arise in REDD+. The following is a list of terms often used in REDD+, along with an explanation of how they are used in the context of this report.

ERP means a REDD+ emission reductions program carried-out at the national or sub-national level and includes national policies and programs, subnational activities, and discrete projects.

MRV means measurement, reporting and verification.

REDD+ means a national and/or international incentive mechanism for reducing emissions from deforestation, forestation degradation, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries.

REDD+ unit means a unit issued to reward ERPs for their emission reductions or removals in accordance with the relevant national rules (and the chosen standard or international program). It may be recorded in tCO₂e or other units of measurement.

Reference level refers to a baseline (emissions or another agreed) against which national or ERP performance can be assessed. The scope and details for setting reference levels have still to be agreed at the international level and could include: national and subnational reference levels based on historical and/or projected baselines.

Registry means the electronic infrastructure designed specifically to ensure accurate, efficient and transparent recording of ERPs and their respective emission reductions or other performance indicators, as well as the issuance of REDD+ units and/or tracking of results-based payments.

Results-based payments means the funding made available for ERPs in accordance with their respective performance and measured either in the form of emissions reductions or removals effectively achieved by the relevant ERP or other agreed metrics and proxies. The source of funding could be public and/or private.

Subnational activity means REDD+ activities carried-out at the subnational level (by both subnational governments and non-governmental actors) and in line with the national REDD+ strategy.

Unit means a REDD+ unit.



Key Requirements

Introduction

The team conducted a combination of in-person and telephone interviews with representatives from (i) developing countries implementing REDD+; (ii) donor governments and institutions interested in paying for emission reductions from REDD+; (iii) other government and intergovernmental agencies involved in registries, and (iv) project developers and traders. We interviewed representatives from Colombia, Germany, Kenya, Norway, the United Kingdom, the California Air Resources Board, World Bank, UNFCCC Secretariat, Conservation International (international project developer/investor), Plant Inteligência Ambiental (South American project developer), and Poefer International (European trading house/investor). Additional written comments were received from a number of individuals on an earlier draft of this report.

On 14 February 2011, a workshop was held with experts from German government agencies and NGOs at KfW Bankengruppe in Frankfurt am Main (Germany) to discuss results of the report.

The ability to consult more widely was limited by time, and we recognize that this is not an exhaustive list of groups that may have valuable insights into key issues. However, this brief survey has provided a useful snapshot that identifies a number of commonalities and only a few differences between groups. These are highlighted below and discussed in more detail in sections 3 and 4 of the report.

Commonly Identified Requirements

All interviewees agree that at a minimum a national REDD+ registry should ensure environmental integrity, transparency, and efficiency:

Environmental integrity can be ensured by

(i) the policy or standard that sets the eligibility requirements for a bona fide ERP and, (ii) recording and tracking ERPs, emission reductions, and REDD+ units or results-based payments. Two distinct environmental integrity issues were identified that could be addressed by a registry – double counting and domestic leakage.

Double counting can come in two forms – double counting of emission reductions from the same area of forest by two different ERPs, and double counting of the same emission reduction at the subnational, regional, and/or national level. Both of these can be addressed by a registry.

A registry can address some aspects of leakage, depending on the way the infrastructure is applied. For discrete ERPs that are not yet linked into a regional or national reference scenario, leakage is best addressed by the policy or standard that determines what is an eligible ERP. Such standards can be set by the hosting government and can include the management of leakage through, for example, buffers or insurance systems. In this case the relevant information of non-registered ERPs is not recorded in the registry. A registry will, however, be able to track domestic leakage when a regional or national reference scenario is recorded in the registry. When a registry is used in a national system domestic leakage will automatically be captured within the national MRV.

Ensuring transparency is one of the key functions of registry. Some registry functions should be accessible to the public, others could be limited to account holders, governments, regulators or beneficiaries of ERPs as required. Details of ERPs, REDD+ units, regional or national reference scenarios could be recorded in the registry to promote transparency.

Financial and operational efficiency should be important attributes of a national REDD+ registry. Infrastructure requirements should

be designed to leverage existing infrastructure, maximize efficiency and enable operational and transaction costs to be low – particularly when a registry is first established. A registry should also be managed in an efficient manner that allows prompt registration of ERPs and their respective performance, reference levels, and REDD+ units or results-based payments as required.

Other Requirements and Issues

Based on the interviews to date, the value of establishing national REDD+ registries seems to be universally recognized. In addition some basic functions there was general agreement that a registry could evolve and become more sophisticated over time in response to national and international requirements and national capabilities. Most interviewees agreed that national REDD+ registries should eventually – once an international REDD+ mechanism has been established – adhere to a mixture of internationally agreed policy requirements and additional domestic requirements. The compliance with international rules may reflect a phased approach of increasingly sophisticated international and domestic requirements as a country's national REDD+ strategy, its MRV capabilities, and the international financial mechanism(s) for REDD+ evolve.

In the absence of an international REDD+ mechanism, international criteria may be replaced by de minimis criteria or standards agreed between developed and developing countries and complemented by additional domestic requirements. Some interviewees indicated a national REDD+ registry should record all voluntary market projects irrespective of the standard chosen. Others indicated domestic regulations could specify particular voluntary market standards deemed acceptable in that country, and only allow voluntary market projects that comply with those standards in that country to be



registered (either in the national REDD+ registry or in the relevant standard's registry infrastructure). As an alternative, countries may even choose to not allow any existing voluntary market projects if they opt for a non-market approach but decide to apply a registry.

This project or ERP based approach for using a registry is not the only option or use for a national REDD+ registry. A national REDD+ registry can also be applied in national or top down approaches to REDD+ implementation. In national schemes a registry can track distributions of benefits within the country. It could also be used to track any re-assignment or adjustment of benefits accruing from emission reductions within a country. For example, a country could choose to re-assign some of the benefits generated by reducing emissions in areas of the country with high deforestation rates to pay for the conservation of forest carbon stocks in those areas with lower deforestation rates. This could also be tracked in a national REDD+ registry.

Some of the people interviewed would like to see registration of safeguard compliance and environmental co-benefits. While international and national policies should

determine what safeguards are applicable to REDD+ activities and how those safeguards are assessed and complied with, a registry could record safeguard compliance and make transparent a wide number of social and environmental issues required by policy, such as stakeholder consultation, benefit sharing, and additional environmental benefits.

A registry could further track financial flows. Some interviewees would like to use the registry to ensure that financial flows were linked to specific emission reductions. Other interviewees raised concerns over commercially sensitive information being included in a registry that was accessible to the public.

Interviewees had mixed views on who could manage a national registry. A registry could be managed by a government agency, outsourced to a third party, or a combination of both. Issues that came up in interviews around these options were (i) the ability for a government to outsource regulatory functions to third parties, which may be limited in some jurisdictions; (ii) ensuring a registry is managed in an efficient manner that is free from conflicts of interest, improper influences, or bias; (iii) financial, technical,

and capacity requirements for operating a registry.

A number of additional issues were also discussed with interviewees to different degrees. These include registration of regional or national reference scenarios; integration of subnational activities within these broader reference scenarios; assessing regional or national performance against registered reference levels; MRV; the role of policy vs. the role of the registry; other entities or institutions the REDD+ registry will need to interact with; linkages between national and potentially international registries; unit ownership and other legal issues; nationalization or expropriation of subnational REDD+ units; the potential to either support or crowd out private sector investment; comparability of units registered within and across national registries; costs; permanence and different options to address permanence and how this could be handled by a registry; and the ability for a registry to provide consistency over time, space within a country, units, programs, and countries. Many of these issues will have different levels of significance in different countries. How a registry responds to each issue may also be determined on a country by country basis.

National REDD+ Registry: Value & Function

Overview

Registries can help ensure confidence, integrity, transparency and efficiency of information relating to ERPs, and any units and / or payments issued for it. When designing REDD+ incentives, financing mechanisms and payment-based programs, registries will be required to play a key role ensuring that important information is captured, processed, stored, and accessible when required. This will help promote the credibility of REDD+ reductions and ensure that there is one aggregated and centralized repository of information to record and disclose this information.

Registries generally exist to evidence and confirm particular information and enable the storage and retrieval of that information. There are a number of types of registries and to many the term "registry" is most commonly used in the context of carbon markets. Registries have played a key role in the carbon market where there are a number of factors, including geographical, political, cultural and informational variables, contributing to the nature of the information tracked and the various outcomes. In this arena, a registry has a variety of definitions and covers an array of systems and functionality: registries are used to track verified corporate emissions, issuance, retirement and transfer of pollution allowances, and verified offsets within regulatory or voluntary frameworks.

In a REDD+ context, regardless of whether a market-based mechanism is established, a registry can aggregate and track multiple levels of ERP activity (national, subnational and project-based) and can provide governments and donors with transparent and meaningful data from which to make results-based payments. For the purposes of this report, the term "registry" therefore refers to the electronic infrastructure designed specifically to ensure accurate accounting of ERPs and their respective performance (measured either

through emission reductions or removals, or another agreed performance metric) as well as the issuance of REDD+ units or the recording of results-based payments, irrespective of whether the units are transacting within a market framework.

However, where the jurisdiction in which the ERPs operate supports a marketplace for REDD+ units, then the rationale for a properly designed registry is even stronger. Establishing clarity around the nature and ownership of any asset is critical to enable it to transact a performance payment efficiently and with confidence. Registries currently provide this function in local and global markets all over the world and are increasingly used in a number of other emerging environmental markets, such as water quality markets or biodiversity offsetting.

Figure 1 illustrates the parallels drawn between two types of programs and what the registry can track within each. The two tracks could represent parallel approaches in two countries – one that adopts markets and another that does not – or the non-market approach could also precede implementation of market approaches.

Value of a Registry

As can be seen from the previous section, registries are more than a unit tracking facility and are becoming a key source of operational efficiency, transparency, and risk reduction for investors, governments, participants, and commentators in emission reduction and removal programs. Registries are neutral quantitative tools responsive to the informational and infrastructural needs of participants based on laws, rules, practices or guidance. Therefore, it is not the role of the registry provider to make subjective assessments of matters that are better addressed in law, policy or standards. Examples of such matters in the context of REDD+ may include:

- How proof of ownership of a unit can be ascertained and reconciled (i.e. authorization, documentation and representations that are required);
- How compliance with environmental and social safeguards may be checked;
- How a consolidated record of land-use activities and unit issuance at the national level can occur and what information is required to be captured, by whom, and how it is validated and authorized;
- How projects, subnational and national issuance of units can be harmonized and controlled;
- How domestic leakage can be best managed in stand-alone ERPs;
- How to determine any buffer / reserve quantities;
- Which documents are required for registration of an ERP;
- What deviations from standards/policies are permitted;
- Confirming calculations relating to matters such as reference scenarios;
- Ascertaining if MRV undertaken is sufficient for the purposes of the program; and
- How benefits or emission reduction potential within a national REDD+ reference level are distributed within a country.

The registry is an enabler, not a driver of policy. However, registries will play a key role in data repository (helping bring transparency to the reporting element of MRV) and quantitatively assessing the information provided in compliance with the procedures established by the government, international mechanism, or standards body. In the above examples, where the law, policy or standard requires certain conditions to exist for units to be issued or payments to be made, these rules must state those conditions together with the documentation required to evidence those conditions, such as a particular section in a verification report confirming those conditions have been met to the verifier's satisfaction. The registry can then

in turn confirm that the relevant document requirements have been met.

Environmental registries have evolved over the past six years to become more horizontally and vertically integrated into both the marketplace as well as environmental compliance systems, such as those operated by governments. In addition to the core functions of project registration, serialized unit issuance, automated transfer and retirement, some registries now provide more sophisticated document storage and information encryption. Some registries also provide regulatory access, financial markets connectivity, and deeper integration into environmental crediting frameworks enabling the listing of many different types of environmental units beyond emission allowances, reductions or removals. Other registries add functionality by listing additional certifications and attributes relating to carbon units (i.e. social, community and biodiversity benefits).

A registry is central to achieving a low cost, low risk, efficient and transparent environmental payment-based program. Four key tenets of registry design, with specific reference to REDD+, are listed in Table 1 (page 15).

Section 4 outlines design options that specifically address how environmental integrity, accountability, efficiency and transparency can be ensured for ERPs using national REDD+ registry infrastructure.

Challenges For Environmental Payment-Based Programs Without Registries

Environmental payment-based programs in existence that do not use registry infrastructure have suffered from a lack of transparency.²

Unit holdings are recorded in various ways across the many regional, state and federal offices and in some cases where there are market-based transactions between third parties (i.e. where the buyer is not buying for compliance obligations), the transaction is not recorded other than on the project developer's own unit ledger. Participants, project developers, regulators and commentators in these programs have expressed concerns about the limitations caused by the lack of infrastructure in these programs, citing the following as undesirable outcomes:

- No transparency or 'birds eye real-time view' of environmental units issued or held;
- Risk of double-selling of units and reduced industry credibility;
- Difficulties with visibility of environmental units issued, and / or for sale;
- Lack of confidence in integrity of environmental outcomes;

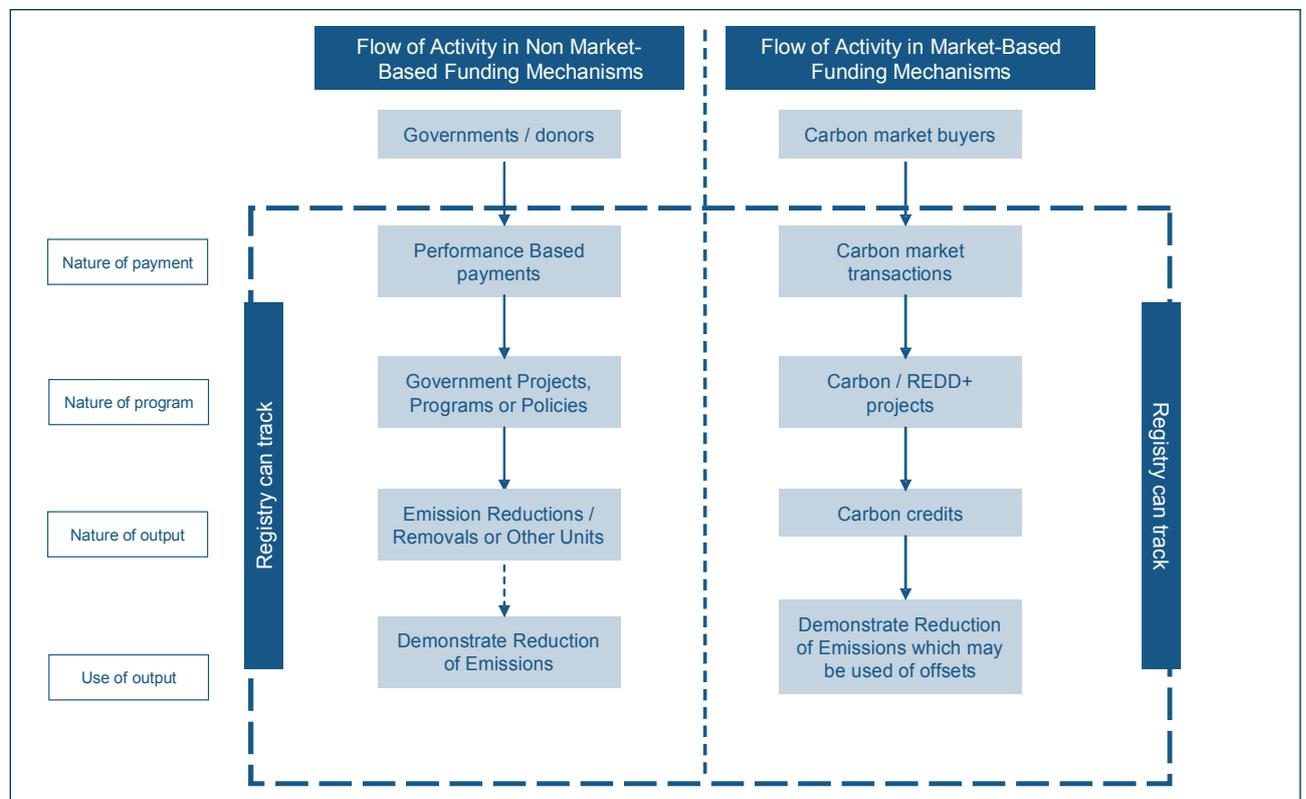


Figure 1: Use of a Registry in Market and Non-Market Approaches

² The United States federal conservation and wetlands mitigation banking programs are examples of programs where registries are not used.

- Inefficient paper-based processes;
- High search time and costs for buyers of units;
- Potential investments treated, by default, as high risk / low return; and
- Opaque and inefficient markets

A registry can manage these challenges and help create effective environmental outcomes, while at the same time ensuring an efficient and transparent view of unit ownership and the broader program / marketplace at any time. In the longer term, the implementation of registry infrastructure promotes increased confidence, participa-

tion, and investment in these new payment-based programs.

As different REDD+ standards are in operation already, with various approaches to unit issuance, risk management procedures and various types of registry infrastructure, the risk of double counting and inconsistent unit issuance are key issues. If not managed properly, these issues could harm the credibility of establishing REDD+ activities and ultimately REDD+ funding mechanisms.

The registry will play a key role in establishing and supporting these activities, and

any subsequent markets or other funding mechanisms that may eventuate through well-developed planning, prototyping and developing a scalable registry solution.

Existing Regulated and Voluntary Carbon Market Registry Infrastructure

Compliance Carbon Market Registries

The largest global compliance carbon market activity is founded on the basis of the Kyoto Protocol and comprises a network

Environmental Integrity	Accountability	Efficiency	Transparency
Reduce risk of double counting	Quantitative checks of documentation and registration information	Unit issuance / tracking and transfer	Vital information provided to the stakeholders
Prevent overselling units	Compliance checks	Flexible reporting and account management	Unit balance information can feed into other databases
Ensure emissions reduction issuances do not exceed national reference scenarios	Traceability of units issued, transacted and retired	Centralized tracking of funding streams	Centralized storage of relevant information
Manage buffers / reserves and facilitates issuance of temporary units / units with expiration dates to help protect against non-permanence risks	Regulatory approval processes	Scalable electronic infrastructure	Transaction history by customer and by activity for units. Unit balances are available to indicate units available for sale
Assign units within a national scheme to individual or collective rightholders and/or beneficiaries	Units serialized to ensure efficient traceability	Low transaction costs	Real time record of unit ownership
	Land use project information upload, storage, access	Integration with other market tools (where appropriate) for timely access to and operation of other market infrastructure	Tracking safeguard compliance and co-benefits
	Indication of compliance eligibility on issuance		

Table 1: Key Tenets of Registry Design

of national registries and one central “international transaction log” (ITL) operated by the UNFCCC Secretariat. The Kyoto registry system currently operates in a manner that ensures environmental integrity by tracking Kyoto units and avoiding double counting in CDM and JI projects. “Annex I parties”³ must establish a national registry to ensure accurate tracking and holding of Kyoto units. Annex I registries are managed by the individual countries and are designed to carry the following transaction types: issuance, transfer, acquisition, cancellation, replacement, retirement and carry-over of Kyoto units. Issuance may include issuance of new units such as Removal Units (RMUs) or conversion of one type of unit (e.g. an AAU) into another type of unit (e.g. an ERU for a JI project). This conversion for ERUs effectively stops double counting in JI projects that are necessarily included in the national reporting and inventories.

These national registries are required to interact electronically with the UNFCCC ITL, which validates requested activities on the network and communicates across the registry system. Before a national registry instruction such as a transfer from one account to another account in a different national registry can be acted upon, it must be verified by the ITL. The instruction is sent to the ITL by the national registry system via a secure computer-to-computer connection enabling the ITL to undertake a validation check and then confirm the instruction back to the national registry. For those Annex I parties that are also EU member states, there is an additional step in the registry validation process. The Community Independent Transaction Log (CITL) has been created specifically as a supplementary transaction log for the EU Emissions Trading Scheme (EU ETS). The CITL records and validates transactions of allowances between member states in accordance with the rules of the EU ETS.⁴ Figure 2 depicts at a high level how the Kyoto/EU ETS registry network operates.

Issuance of certified emission reductions (CERs) under the Clean Development Mechanism (CDM) under the Kyoto Protocol also takes place within this network. The UNFCCC Secretariat operates a CDM registry into which CERs are issued and then transferred to the relevant national registry, all via the ITL.

There are a very small number of compliance registry infrastructure providers servicing the entire global Kyoto compliance market registry system, and while the connection requirements are the same across the network, different providers offer different levels of flexibility, with some offering integration with financial markets infrastructure to enable low cost, low risk and efficient transacting.⁵

Voluntary Carbon Market Registries

The core difference between the compliance registry network and registries operated in the voluntary carbon market centres on the very different origins of the two markets. In the compliance market, the Kyoto Protocol accounting and reporting rules acts like one very large carbon standard overseen by an overarching secretariat pursuant to a set of internationally agreed requirements governing issues such as infrastructure, issuance, and treatment of the units created.

However, the voluntary carbon market arose from a completely different context and comprises a number of different carbon offset accounting standards all with differing rules, infrastructure requirements and in most cases without any overarching standards body actively approving issuance and treatment of the units created. The standards and documentation existing in the voluntary carbon market focus almost entirely on the supply side of the market (i.e. what has to be done in order to have a units issued). While the demand side has numerous drivers, almost all of them arose as the market evolved or more recently govern-

ment rule or guidance on the types of units that can be purchased in such jurisdictions.⁶

Over the past 3 years, the administrative bodies/boards of the main 6-8 voluntary carbon accounting standards have taken different approaches when using registries to track issuance of units under their standards. Most major standards are linked with a third party registry provider and some standards authorities (such as the Voluntary Carbon Standard Association (VCSA) or The Gold Standard) have established a very structured approach to registry operations, including drafting operating procedures and audit requirements. Other standards authorities are less involved in the registry functions and procedures.

Registry infrastructure in the voluntary carbon market is delivered by 2-3 main providers, most being selected directly by the administrative body, authority or board of the carbon accounting standard on an exclusive basis. There is a definitive and measurable trend towards registry usage in the voluntary carbon market given the confidence, transparency, efficiency and credibility that registry use helps deliver to sellers and buyers in that market (particularly in the absence of a compliance framework underpinning these standards). It is anticipated that this trend will continue to increase and particularly that all voluntary market-based REDD+ activities resulting in issuance of units (under standards such as the Voluntary Carbon Standard, CarbonFix, Plan Vivo and others) will be listed in these registries.

Overview of Registry Infrastructure

The following high level summary of the technology, rules and operational processes of registries combines and highlights common functionality across the compliance and voluntary carbon markets as appli-

³ Industrialized countries and economies in transition listed in Annex I of the UNFCCC and which have committed to reduce their emission levels of greenhouse gasses to targets under the Kyoto Protocol.

⁴ Note that on 7 October 2010, Commission Regulation (EU) No 920/2010 was passed prescribing a single Union Registry after 2012 which will process all transfers and operate a single infrastructure on behalf of national registries. National registries will remain responsible for functions required under the Kyoto Protocol.

cable to national REDD+ registries. At the operational level, a registry is essentially infrastructure comprising (i) technology; (ii) rules; and (iii) operational processes. Most registries operating in carbon markets operate a similar base technology infrastructure whereby users open accounts, hold "currencies" (in this case various forms of units) and communicate with a central operations body regarding movement of those units. However, the compliance carbon market registry infrastructure, being underpinned by an international agreement, has, by necessity, stronger inter-connectivity than voluntary carbon market registry infrastructure.

Technology

Registries are generally implemented as fully authenticated and authorized systems, with user credentials stored in a centralized

location with restricted access. All passwords are encrypted and are visible only to the authenticating party. Registry technology can be implemented as a tiered solution with a web-based front end that presents user-friendly interfaces for entering and manipulating data as well as viewing information available on the registry. The middle tier holds all of the business logic for account and unit manipulation. The bottom tier is the underlying database that stores this information and provides full audit trail functionality of all registry activity. Access is generally 24/7 to reflect the global nature of these markets and ensure that timezones do not prevent reporting and transactions occurring in the registry.

In most cases, there are various levels of access available for users ranging from super-user access for administrators, through "view only" access for certain

holders (organizations and sometimes individuals). An operations team / registry administrator has super-user access enabling administrative management of accounts, project activation, issuance activation and generally operations capability. Other user types will include account holders (organizations and sometimes individuals), operators and sometimes verifiers. Rules regarding entitlements to access of the registry are usually based on access levels (e.g. "read only", "read / write" and full administrator functions). In addition, registries could provide further access flexibility. For example, a user could be entitled to access one or more particular accounts within the registry or also they could be entitled to access accounts in which units issued under a particular standard / program are held.

A registry is a centralized system facilitating the opening of accounts, the creation of an

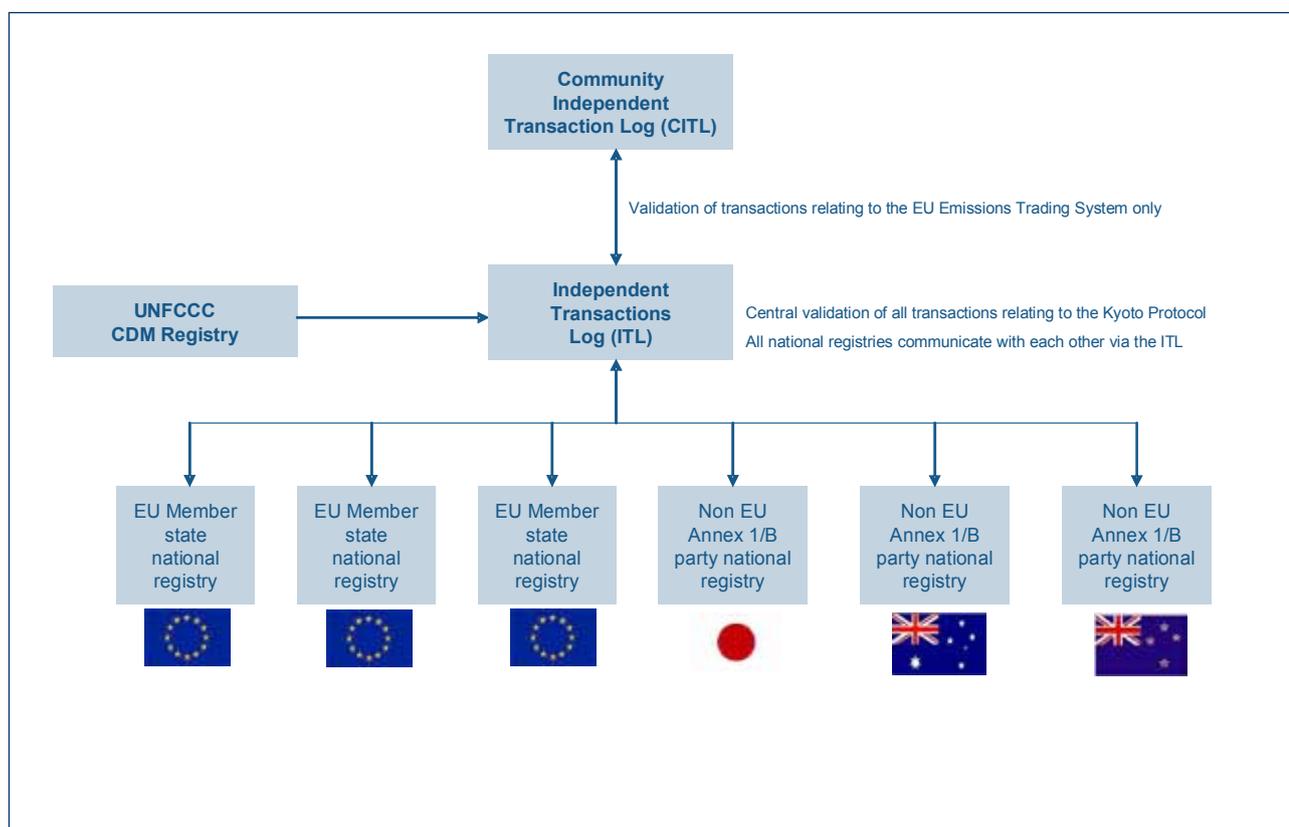


Figure 2: Overview of the Kyoto and EU Registries

⁵ For example, the Seringas registry software developed by CDC Climat enables instructions to be inputted through an API interface and facilitates delivery versus payment for transactions, eliminating settlement risk for participants.

⁶ See for example the Australian Government's new Australian National Carbon Offset Standard (NCOS) which came into effect in July 2010 and guides businesses and consumers on the integrity of voluntary carbon offsetting and provides a standard for becoming carbon neutral.



activity record, and the listing or issuance of units generated from that activity pursuant to the inbuilt rules established in the registry as determined on a standard-by-standard basis. Once listed or issued, units can transfer across accounts and ultimately be retired (or cancelled) in order to remove the unit from circulation so that any environmental benefits underpinning the unit cannot be claimed more than once.

Most registries operate their systems based on international date formats and using the English language, as this is the standard language for the Kyoto compliance carbon market and most voluntary carbon standards. It is possible to implement registry systems using other languages. Once the underlying registry infrastructure is set up to support multiple languages, new languages can be added at minimal cost. Long-term electronic document storage for (10 to 12 years) in registries facilitates

document recovery in the event of audit or other legal requirements.

Registries generally have a public area and a secure area enabling transparency and confidentiality where required. The EU Commission and the UNFCCC Secretariat have issued technical specifications on security and connectivity for compliance market registries that would be applicable to a national REDD+ Registry. Most voluntary carbon registries would comply with these security requirements.

It is important to note at the outset that registry technology is essentially database driven. It is not particularly complex to implement if designed correctly at the outset. Registries have evolved to specifically take into account key design requirements of the emerging policy and market dynamics (including security, efficiency, scalability and operational integrity). While it is tempting

to start with what may appear as simpler technology options, such as recording and tracking basic data in a spreadsheet or databases before progressing to more sophisticated technology, such an approach will lose the benefits that can be found in a registry and put a national REDD+ registry years behind other carbon finance programs. However, technology should not be seen as a complicating factor in designing or implementing a REDD+ program, whether nationally or globally. Clear policy considerations and government/finance requirements are the more complex elements, and it is addressing these issues rather than registry technology that will enable registries to be designed and implemented efficiently most importantly, cost effectively.

Rules

In compliance markets, Annex 1 countries have generally passed local legislation ensuring the status of their Kyoto compliance registries and the collection of information, functionality and operation of their system. Similarly, in the case of the CDM registry, specific Kyoto rules on the operation of the registry apply. However, in voluntary markets, in the absence of legal frameworks governing registry operation, registries have developed their own terms and conditions that govern registry operation and behaviour of its users. Generally these rules link with standards and regulatory requirements and establish warranties and representations regarding the integrity of documentation and user operation. To ensure flexibility and integrity, the rules usually permit agency/principal operation, account and credit suspension, and cancellation rights. The rules also address regulatory reporting and information distribution requirements, financial markets integration and legal and regulatory considerations. In addition to the terms of use, registry rules may comprise some form of identification verification (which may include anti-money laundering checks), privacy policies and enrollment or

eligibility checks (including regulatory approval facilities built into the Registry given restricted account access at various levels). Some registries also facilitate eligibility checks to manage any restrictions that may be placed on who is permitted to have units issued to them from ERPs.

Operational Processes

To support operation of the registry and ensure integrity of registry data and documentation, issuance actions and overall account and holder information, registries are supported by administrators. In the case of the CDM, the UNFCCC Secretariat is charged with the administration of the CDM registry. Annex I countries in turn normally engage a third-party provider to operate the registry under the authority of a national agency. In voluntary markets, the role of administrator of the registry for the relevant voluntary carbon standard is performed by an operations team of the registry infrastructure provider who carry out registry procedures in accordance with documented checks approved by the relevant standards body.

In both compliance and voluntary market registries, operational processes include the opening of registry accounts for users (including proof of identification, log in details and password), documentation checks for registration of activities that are reducing emissions, unit issuance pursuant to the relevant rules or standard, and daily registry operation (transfer, retirement, cancellation, etc.). After a review of the key documentation in accordance with the registry procedures and ensuring compliance with the applicable standard or program, the registry can activate issuance of the emission reduction units. Where documentation is incomplete or inaccurate based on those procedures, the registration or issuance will be rejected until compliant documentation is provided. When compliant documentation is received, the operations team can electronically activate the registration or

issuance in the registry. This activation will enable subsequent actions to be taken by the users, e.g. if registration was activated, an issuance can be requested electronically. If issuance was activated, the units can be transferred to buyers when a sale occurs (the transfer in the registry effects the change of ownership). Units can also be transferred into the account holder's retirement (or cancellation) account in order to remove the unit from circulation so that any environmental benefits underpinning the unit cannot be claimed more than once.

National REDD+ Registry Design Options



In outlining the value and possible design options of registry infrastructure for REDD+ partner countries, this report takes into account the current state of REDD+ implementation (REDD+ readiness activities with additional voluntary carbon market activities) together with a potential future REDD+ mechanism supported by a deeper regional, national, or possibly global compliance market. This section starts with an overview of a possible approach to implementing a REDD+ registry in phases followed by a series of design options, regulatory and other issues.

It is important to note upfront that no singular registry system existing today currently meets all of the requirements for a national REDD+ registry. The compliance registry network has a lot of connectivity, communication and issuance protocols and structures that are beneficial for REDD+ registry design and could be carried over. Equally, voluntary

market registries manage a lot of complexities that are not (yet) relevant for national REDD+ registries. Voluntary registries (particularly those that list units for more than one carbon standard) frequently have to manage the complexities of time (changing rules and grandfathering from one system to another), space (tracking various activities within a boundary), overlapping programs (managing issuance across two standards such as the CDM and the VCS), multiple standard types (some registries track units from a number of different standards in one account system), and various program types (applications of different rules and procedures across the various standards). National REDD+ registries on the other hand, by their very nature, have a lot of the qualities that are required to manage REDD+ at the national level in a registry system. Therefore, a consolidation of the key design criteria taken from both existing registry infrastructure as well as additional requirements for

REDD+ not present in current systems is key to ensure optimal design and described in this section.

Potential REDD+ Registry Phases

Taking into account the emerging nature of a REDD+ mechanism, the initially limited number of ERPs, and the evolving institutional capacities around REDD+ readiness and implementation, countries may wish to start by implementing a national REDD+ registry to simply capture core information for each discrete ERP and track the activity and its performance within the registry (ERP Tracking). Performance can be measured either in tonnes of CO₂e reduced or removed or through another metrics or proxies.

As national MRV capacities grow and a national reference level is adopted, the various reference levels (national, regional, sub-national) can be consolidated and the outcomes of ERPs could be recorded and their respective REDD+ units issued and/or results-based payments tracked by the registry (Issuance and Unit Tracking). A REDD+ registry will also facilitate the issuance of different types of units. Particularly relevant for REDD+ are those units that may be issued pursuant to the relevant carbon accounting standard into a buffer / reserve account in order to manage permanence issues. The standard will dictate the quantity of credits being issued for a project that need to be issued as buffer / reserve credits and not able to be dealt with by the project developer and must be managed according to the relevant rules of the standard.

Finally, as REDD+ markets evolve more fully, and if a country opts to either establish a national market in REDD+ units or through a link with international or other national registries, countries may opt to expand their use of the registry infrastructure by utilizing additional functionality and participate in international REDD+ markets (Trade Registry).

Registry to Track ERPs

Initially national REDD+ registries could be designed to simply record and track ERPs and their performance. This type of registry could be established relatively easily and serve countries by ensuring that there is no double counting of emission reductions from overlapping ERPs and that environmental benefits of ERPs are transparent and centrally recorded.

A country could register REDD+ ERPs that are found to be in line with the adopted REDD+ strategy and in compliance with national criteria (and any chosen standard or international program). It would be up to the country to decide what to register. For example, ERPs could be limited to those proposed by public entities at the national, regional or municipal level. A country could also choose to register ERPs for the benefit and under the name of international organizations, bilateral partners, NGOs or private developers. It could also refer to approved voluntary market standards and registries to ensure full transparency and recording of ERPs within the country.

Where it is not possible to account for ERPs in tCO₂e due to a lack of sufficient MRV information, in some circumstances initial performance may be measured via proxies for environmental REDD+ benefits. Some results-based payments may be made based on carrying out land use activities, but prior to verification and issuance of such units representing accurate or precisely measured tCO₂e reductions. Alternatively proxies such as hectares may be converted into approximate tCO₂e using conservative default factors.⁷ Where there is a mix of units recorded, the registry will need to be able to clearly differentiate between each unit type and track the different units separately, maintaining transparency at all times. At the early stages, the fact that some of the units being recorded are not necessarily comparable with other units recording in the ERP is less important, as the various types of units will likely be treated differently depend-

ing on the various results-based payment mechanisms in operation where there is not yet a consistent national accounting system in place. As a registry moves to subsequent phases and a comprehensive national MRV system, consistency and comparability of units becomes more important.

In addition, where an area-related unit is recorded, it is important that this can be cancelled and other units based on tCO₂e recorded where this is permitted or required under the ERP. A registry system that only issues REDD+ units based on detailed tCO₂e accounting will not serve the immediate needs of emerging REDD+ programs. It is important that the registry have this flexibility to manage the tracking of different types of ERPs at different stages. Where the information verifying performance and outcomes can be provided for an ERP, results-based payments can also be tracked in the registry at this stage (i.e. each payment made for each ERP can be recorded against the record for that ERP in the registry). Different donors could have access to the ERP record and complete required fields relating to payments, payment dates, and criteria, together with payment confirmations uploaded into the registry if required.

If national rules (and the chosen standard or international program) require specific information to be captured for each ERP, the national REDD+ registry could support such listing of additional information. The information would be stored electronically within each ERP record and would be searchable publicly (except for sensitive information).

In addition to core ERP information being tracked, the ERP location would need to be captured using GPS co-ordinates that were uploaded at the time of ERP registration and stored in the registry for each ERP to enable the registry database to check for overlapping or "double-listed" projects within the Registry. The registry could facilitate the uploading

⁷ An example for such accounting can be found in the agreements between the Government of Brazil and the Governments of Norway and Germany in the context of the Amazon Fund.

of files of co-ordinates containing project boundaries and multiple co-ordinates for spatially disparate activities. This will require set technical specifications for geographic data that is handled by the registry such as KML file format that a registry system can upload and check against. This could also include simple links to Google Earth to record and check project boundaries visually. Procedures that could apply for the registration of ERPs (if non-state actors are authorized to submit ERPs) are summarized in Figure 3 below. Additional design options relevant to ERP activity tracking are set out in section Potential REDD+ Registry Design Features.

Registry to Issue and Track REDD+ Units

When a national reference level is adopted by a REDD+ partner country and MRV tools are implemented within the country, it may be possible to upgrade its registry. An upgraded registry could issue and track

REDD+ units measured in tCO₂e. Alternatively, if REDD+ units are issued by an international body (akin to the CDM Executive Board), the national REDD+ registry may receive and record these internationally issued units. Whether a national registry or international body issues REDD+ units may depend, in part, on the purpose for which those units are used. If units associated with ERPs are used for domestic accounting and benefit allocation purposes, REDD+ policy may support unit issuance by national registries. If the units are to be utilized for international compliance rather than domestic programs, international REDD+ policy may favour issuance of units through an international agency. This may also vary between bilateral and multilateral international requirements. Such registry may also be used for non-market purposes as a means of simply issuing and recording units that are not treated or traded as credits or offsets.

Unit issuance and tracking

Units issued from an ERP are the assets that represent the underlying environmental benefits from the ERP. If national REDD+ registries are involved in unit issuance, the role of the registries in providing credibility, confidence and transparency at the issuance stage is extremely important for the integrity of the country's REDD+ program(s). Procedures could be similar to the CDM registry operated by the UNFCCC Secretariat. The CDM registry does not carry the features of a full trading registry (as it does not allow trading to take place). A simple registry that allows the issuance of REDD+ units, would allow the tracking of units that would have a unique serial number clearly indicating their "origin" and ensuring integrity of issuance of the units.

An upgraded national REDD+ registry with issuance capabilities would be valuable both inside and outside of a market context.

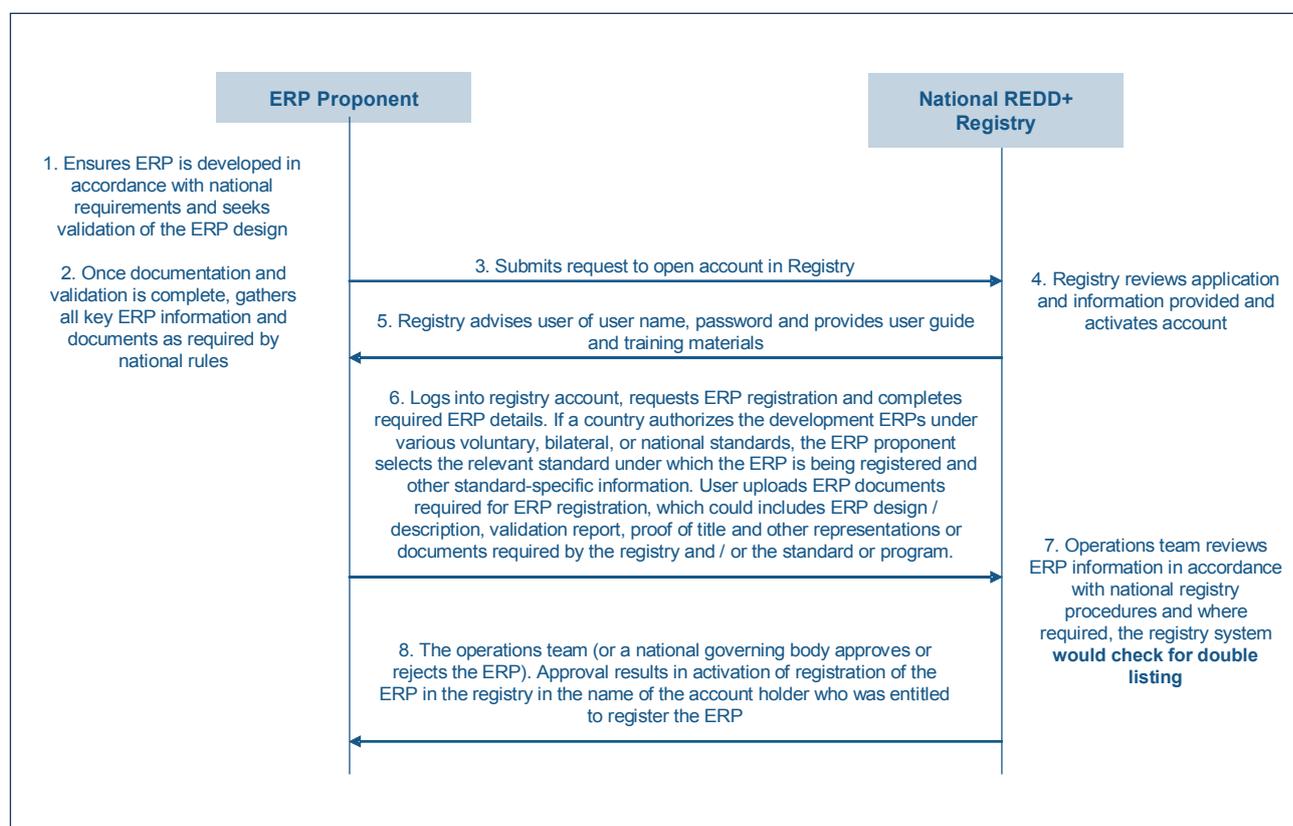


Figure 3: Registration of ERPs in the National REDD+ register

This could occur without issuance (by simply recording the emissions reductions or removals achieved against the activity without them being issued into a holding account) or with issuance of units into an account on the Registry. If units are actually issued, they could be issued and then immediately retired so that there is no transfer of right or title to a buyer, or they could be held ready for transacting if a fully market-based program emerges. A number of players seem to be interested in this concept particularly for large country-wide funding programs, as it enables them to demonstrate a measurable and meaningful return on the investment for investment dollars they have spent.

Registries that activate the issuance of units into registry accounts of national or subnational entities have to perform completeness and compliance checks on submitted MRV documentation. Registry

functionality and operations processes include ensuring verification periods are incorporated, checking issuance volumes relative to monitoring volumes, ensuring accurate "vintage" assignment, managing sequential unit issuance across two different carbon programs (i.e. voluntary into national, or voluntary to compliance) and ensuring the requirements of the relevant standard or program have been met. Registries could facilitate exchange listing electronically from the user's registry account and lock all units that are listed so that they cannot be sold in the interim. This would improve confidence and integrity of market activity. Procedures that could apply for the issuance of units from ERPs into registry accounts to perform completeness and compliance checks on submitted MRV documentation. This is set out in Figure 4 below. Additional information on the design options

relevant to unit tracking and results-based payment tracking are set out in section Potential REDD+ Registry Design Features.

Recording internationally issued units

If REDD policy requires international issuance of REDD+ units, an intermediate registry can also record the units, linking them with specific ERPs. It may also allow the transfer of tradable units into countries that operate fully enabled trading registries.

Registry to Facilitate Entity-Level Trades

The most sophisticated version of a national REDD+ registry would deliver a fully equipped trading registry for holders of REDD+ units to transact them in both local and international markets. Such registry could function as Annex I national registries (and other carbon registries with a high number of users and transaction capacities). Layering upon ERP

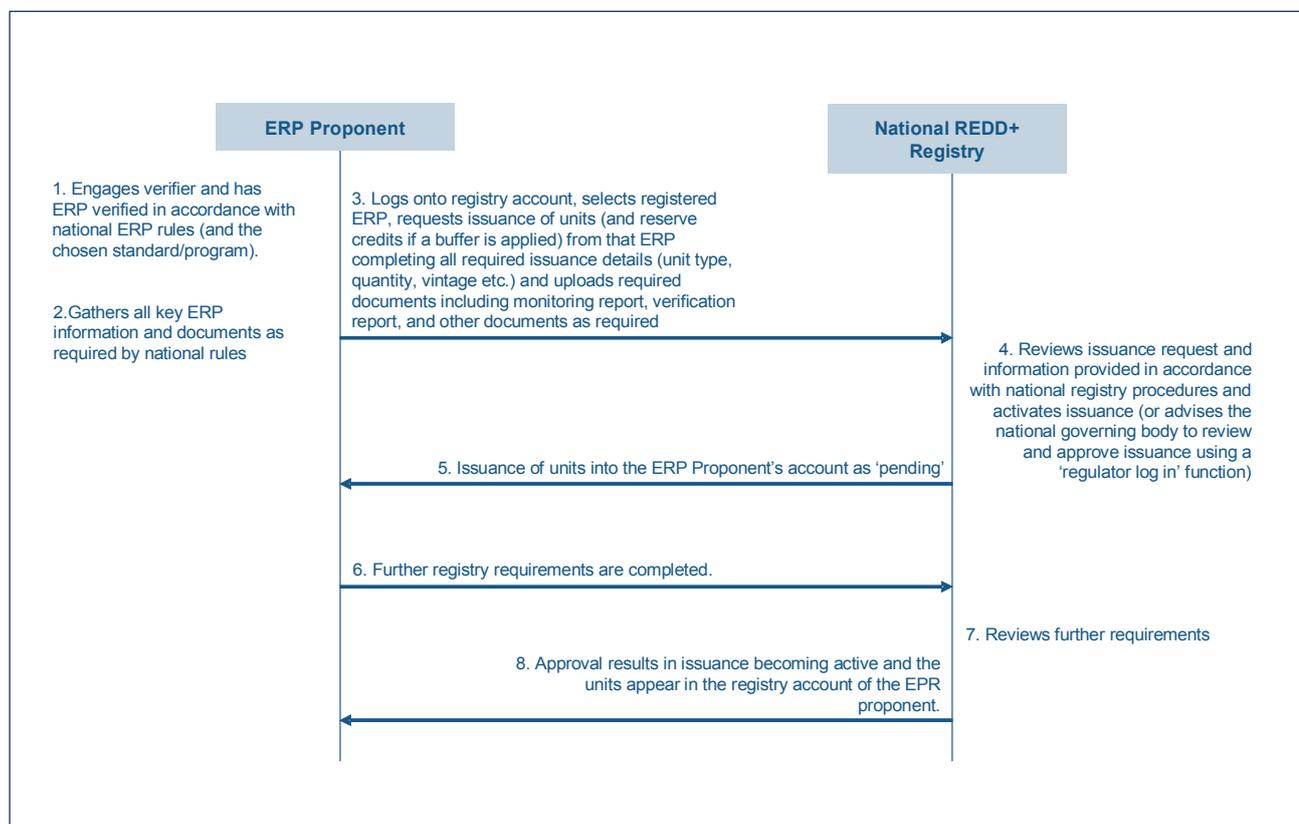


Figure 4: Issuance of units in the National REDD+ registry

registration and issuance under phases 1 and 2 above, a trading REDD+ registry would facilitate the transfer of units between accounts at the national level, track all transfers and unit holdings and, where possible, link with other international registries and market platforms. Upon sale, units can be transferred electronically into other user's accounts using the registry system or using connectivity with clearing and settlement systems that deliver lower risk trade settlement.

Once the units are held by the end buyer, they can either surrender them for compliance (by transferring them into a compliance retirement account operated at the regional or country level) or they voluntarily remove them from circulation in the marketplace by "retiring" them. Retirement of units means that the particular units with those serial numbers cannot be sold, transferred or otherwise used again (i.e. claimed more than once) by the user or anyone else. Therefore, a national REDD+ registry will need retirement accounts (as well as cancellation accounts) for administration and efficient

operation of the registry. Further research into lessons learned from the implementation of the ITL across Kyoto countries (as well as the transition from the CITL to a centralized European registry system) could be undertaken to further expand on the requirements of this phase in subsequent analysis. This additional research is beyond the scope of this initial report.

Figure 5 illustrates the role that the National REDD+ registry could play in the various stages of registration, issuance, and market activity.

Potential REDD+ Registry Design Features

This section identifies features specific to REDD+ in addition to those outlined above and provides analysis and guidance on how these features could or could not be addressed by a national REDD+ registry. The list of potential features is quite long but it is neither definitive nor exhaustive. The list of specific REDD+ features plus key design

features from Table 1 is summarized in Table 2, along with a possible charting of these features and the against the phases discussed in section Potential REDD+ Registry Phases . It should be noted that a number of features are listed as starting in phase 1 and continuing through phases 2 and 3. These features are not always static – they may also evolve and develop (and become more complex) as the registry develops. For example, the operational processes and checks, or document management requirements for a simple registry described in phase 1 will likely be quite different to a trading registry described in phase 3. For simplicity this additional layer of detail is not presented in Table 2.

While registries can help with a number of issues arising in the creation of effective national REDD+ programs, like any infrastructure designed to support a mechanism, they will not solve all challenges associated with REDD+ implementation. Registries can however be a useful tool to ensure transparency

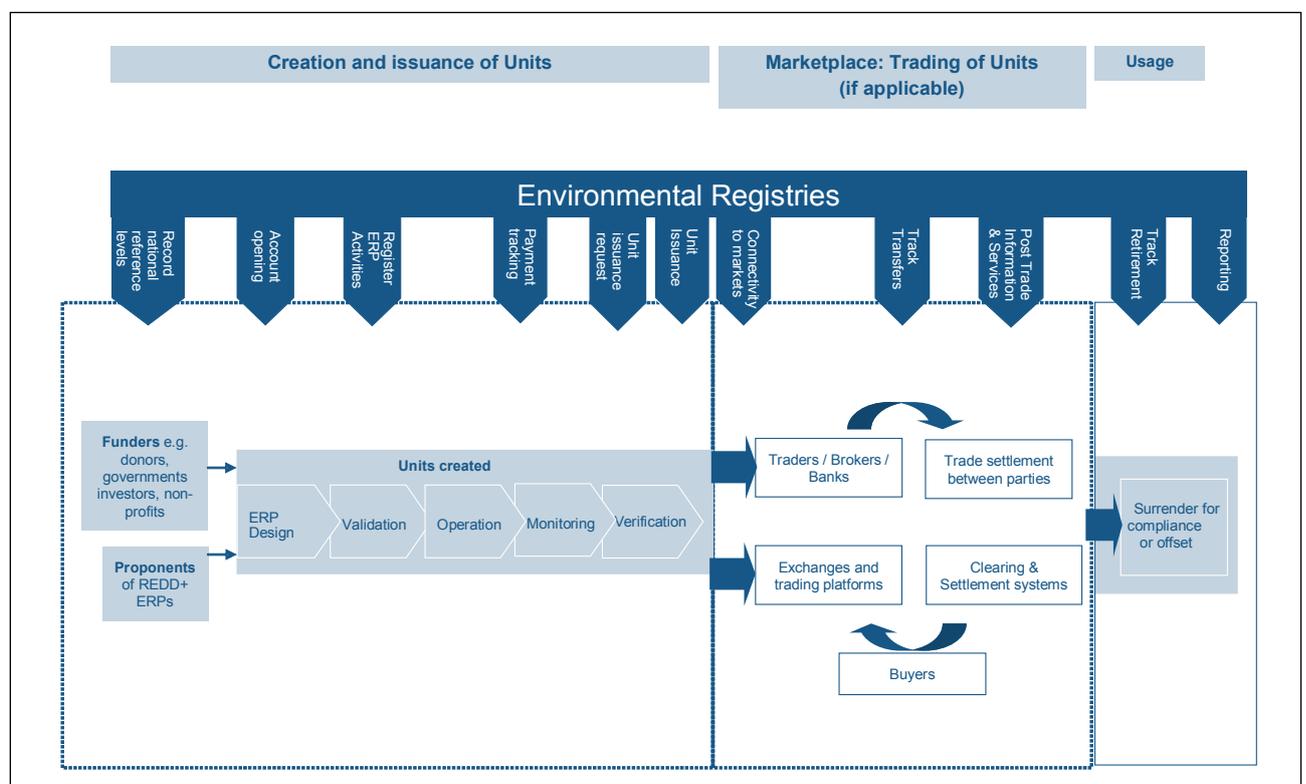


Figure 5: Role of Registry Infrastructure in the various stages of ERPs

and increased efficiency in REDD+ programs and assist with risk management for all participants, and therefore registries are an important element of the national REDD+ architecture.

**Environmental Integrity:
Identification of Double Counting**

Double counting can happen either through a double counting of emission reductions

from the same area of forest by two different ERPs, or through the double counting of the same emission reduction at the sub-national, and regional, or national level.

Design features	Phase 1 Registry to Track ERPs	Phase 2 Registry to issue and track REDD+ units	Phase 3 Registry to facilitate entry-level trades
Environmental integrity	Prevent double counting		
	Register simple reference scenario (RS)	Register and consolidate more detailed RS at different scales	
	Risk management for reversals or emissions that exceed RS		
		Ensure units issued do not exceed national reference scenarios	Manage buffers / reserves and facilitates issuance of temporary units / units with expiration dates to help protect against non-permanence risks
Accountability	Quantitative checks of documentation and registration information Regulatory approval processes Land use project information upload, storage, access		
		Serialized units (Traceability of units issued, transacted and retired)	
		Compliance checks (eligibility of units for compliance) Indication of compliance eligibility on issuance	
Operational efficiency	Document management (including MRV of units and funding) Flexible reporting, account management and auditability Different access levels Centralized tracking of funding streams Scalable electronic infrastructure		
		Unit issuance / tracking and transfer	
		Linkage across registries Integration with other market tools for timely access to and operation of other market infrastructure Low transaction costs	
Transparency	Tracking safeguard compliance and co-benefits ERP and other information provided to the stakeholders		
		Real time record of unit ownership Unit balance information can feed into other databases Centralized storage of relevant information	
		Transaction history by customer and by activity for units.	

Table 2: Registry design features and phases

Identification of double counting of same area of forest

Double counting between ERPs becomes relevant where one or more ERPs claim emission reductions from the same area of forest. A national REDD+ registry can prevent this type of double counting by recording the geographic boundary of ERPs. If someone attempts to register an ERP that overlaps with another already registered ERP, the registry would flag this as a problem for regulators to resolve according to the agreed rules and policy.⁸ To ensure that this occurs with maximum integrity, this tracking and accounting function could include all activities occurring within the country borders (whether they are part of a compliance program or a voluntary program). The activities need to be tracked in a way that will enable a flag to be raised at the registration stage. In the voluntary carbon market, registries for some standards are required to check project databases for compliance market and other voluntary standard programs (where such databases are available and publicly searchable) and some registries have adopted this as best practice for all projects registered on their registry. One option that may go some way to mitigate the double counting risk would be for the list of checks carried out by registries in the voluntary market to include the national REDD+ registry for the country in which the project is being carried out. To facilitate this, government would need to require that all national REDD+ ERPs be recorded within the national REDD+ registry (in a standardized way so as to ensure efficiency) to enable a consolidated view of all environmental units issued within the country.

This would not mean that all units representing emission reductions in the country would have to be issued in the national REDD+ registry, particularly where they were issued under another carbon accounting standard that has already selected a registry provider (e.g. the Voluntary Carbon

Standard, CarbonFix, Plan Vivo etc.). The consolidation of ERPs in a national REDD+ registry can occur even if the actual units issued under a particular standard are listed on another registry – i.e. the registry can act like a chart of accounts recording activity on both sides of the “ledger”. The national REDD+ registry could record the ERP details and the quantity of units issued as “shadow units” (i.e. units that cannot be transferred and are recorded in the registry purely to shadow other units that are registered elsewhere but occur within the country). Subsequent transfers and retirements of the issued units in the other registry would not need to be shadowed as the national REDD+ registry would only be concerned about activity location and the number of units issued for the ERP. Ideally, this requirement would be included in the national rules and criteria of each REDD+ partner country and codified in local law.

In addition to ensuring the integrity of the national REDD+ program, it is important to ensure that the integrity of any units issued under a voluntary carbon standard is ensured when the project occurs in a country with a national REDD+ registry in operation. Therefore, a key requirement to ensure no double counting occurs under any of the other carbon accounting standards would be to obtain agreement with the authorised bodies of the voluntary carbon standards to amend their standards to require, as part of project registration and unit issuance documentation, evidence from the verifier (as the best placed entity to undertake such local checks) that the ERP and any issuance under it, has been registered and shadowed in the national REDD+ registry, prior to issuance of the voluntary units in the “home” registry for that voluntary carbon standard.

These could be important design features of a national REDD+ registry in all three REDD+ phases, but in particular for a Phase 1 Registry. During the first phase of REDD+ mechanism, a central registry may mitigate

the risk that several dispersed discrete ERPs be developed without some minimum coordination and coherence.

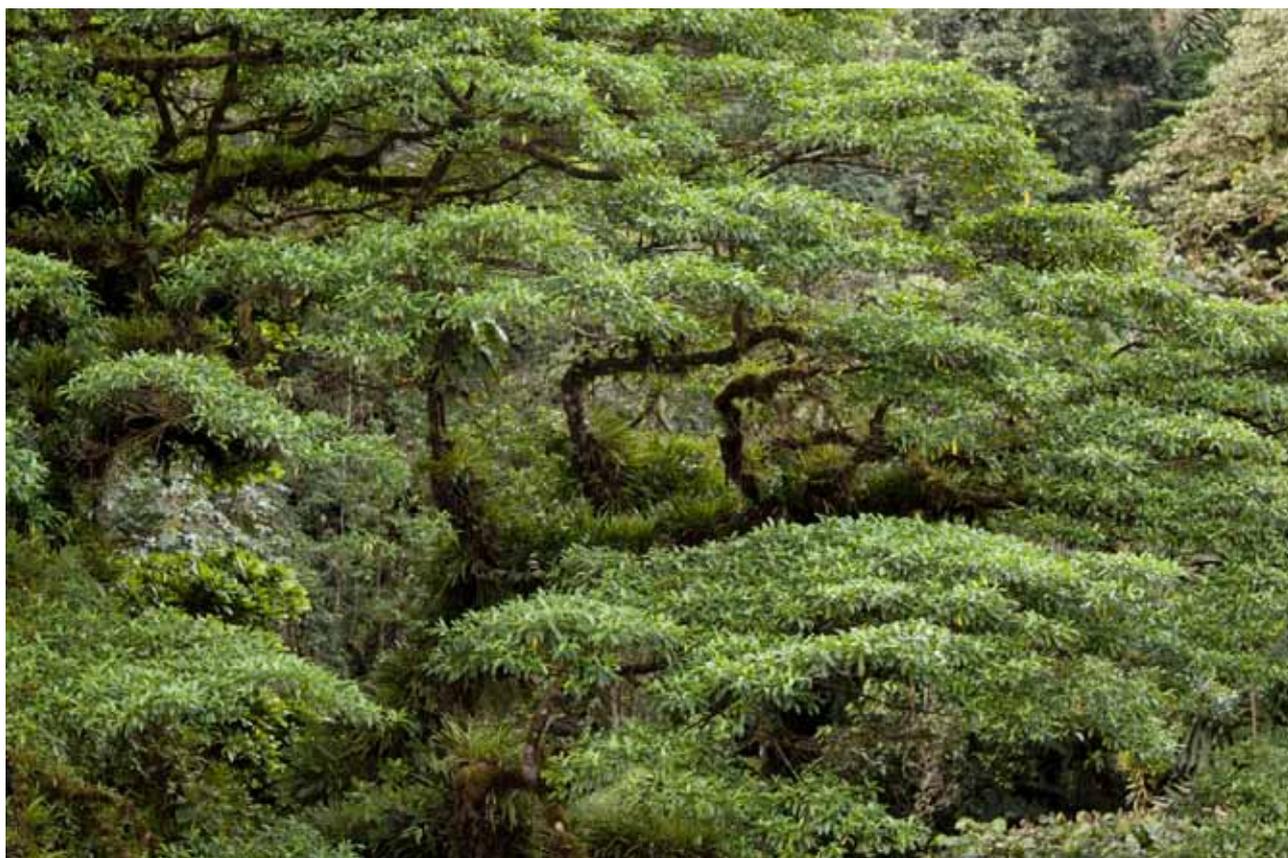
Identification of double counting of the same emission reduction

Additional double counting problems may occur where countries have ERPs within their borders that have already been credited as subnational ERPs in advance of a regional or national accounting framework. Double counting could be avoided by the following measures:

- Emission reductions claimed by an ERP could be deducted from emission reductions claimed at the regional or national level;
- Emission reductions could be issued at the national level first and a regional or national agency could transfer them to subnational, regional, or project-level ERPs.

In the first option above, the national REDD+ registry would record the emission reductions generated from subnational ERPs and deduct the aggregate number of emission reductions of such ERPs from the number of units recorded at the regional or national level. This calculation would only be relevant where the regional or national information was uploaded by the relevant authorities and kept up to date in the REDD+ registry. Any deductions would be done on a first in time basis (i.e. an over calculation of emission reductions in an early ERP may affect permitted issuances for a subsequent ERP). To ensure equity, third party verification of claims made regarding emissions reductions in subnational ERPs is extremely important. Policy also needs to be established to ensure consistent and comparable reference levels and MRV at the subnational ERP and regional or national reference levels(s). This could include subnational ERPs adopting regional or national reference levels and common timing for

⁸ This is essential as very few standards contemplate the risk of an emission reduction being counted at both the voluntary and the compliance level where the project activity occurs within the borders of a country with an emissions trading system in place. For an exception see section 5.2.2. of the VCS 2007.1 which requires evidence in such a situation that the reductions or removals generated by the project will not be used in the emissions trading program or for the purpose of demonstrating compliance with the binding limits that are in place in that jurisdiction or sector.



verifications. Conducting simultaneous verification would prevent those ERPs who happen to have their ERPs verified earlier in the regional accounting cycle benefiting at the expense of later ERPs.

In the second option above, the REDD+ registry would receive the regional or national MRV report and transfer the emission reduction units to the appropriate government account. The government would then be responsible for re-distributing the units among the various ERPs. It is important to note that from the registry's perspective, the subnational ERPs have been completely subsumed within the regional or national unit issuance. However, the registry could still record subnational MRV reports and emission reductions claimed, so that this information was also transparent and available to governments and the general public. This would also highlight any discrepancies that may occur between the amount of

units claimed and received at the subnational level.

In both of these options there may be a timing issue: MRV reports at the subnational and regional or national level need to be compared at the same time to make accurate determinations on where to allocate emission reductions. REDD+ policy will likely need to require subnational MRV reporting to be timed with regional or national MRV reporting and unit creation. Alternatively, each developing country participating could record their national reference level in their national REDD+ Registry. When approving an ERP, the anticipated emission reductions from such program could be entered and the registry would, based on the geographic location of the ERP, check the national (and if applicable subnational) reference levels and the system would raise a flag if the projected emission reductions are more than a certain permitted percentage of the

national reference levels or nearing a limit established in the system.

For a discussion of dealing with the scenario where the amount of emission reductions claimed at the subnational level is greater than that available at the regional or national level, see the following section.

These features would be applicable as soon as the country has been able to establish a national (and/or regional) reference level and MRV.

Environmental Integrity: Reference levels

A REDD+ registry will have to record and consolidate various levels of accuracy and potentially arbitrate between overlapping reference levels based on rules provided to the registry infrastructure provider.

Reference scenarios may be established at the subnational, regional, and national level. These reference scenarios may be geographically explicit (i.e. identify different rates of deforestation within their bounds, such as non-threatened areas and deforestation or degradation "hot spots"). The different levels of reference scenarios should be comparable, though different levels may have different amounts or quality of data. Subnational project and program MRV will likely be more accurate and precise than national or regional MRV data. For example, national reference levels may have information on deforestation rates and location with a certain amount of accuracy and precision. Subnational baselines may also include stock estimates and more precise estimates of deforestation rates and location within their boundary. More accurate subnational ERP level information could be used to help inform and improve national level information and broader national information can also be used as additional validation/checking of the accuracy of subnational level information. A registry can record

the monitoring data submitted to claim emission reductions at the subnational and regional or national level. Comparisons of the data could be carried out by the registry or government authorities tasked with compiling national inventories and national MRV. Inconsistencies between classifications of forest type, carbon stocks, and forest/non-forest lands could be flagged for further study and resolution.

In REDD+, subnational ERPs determine emission reductions from quantifiable improvements against the business-as-usual scenario, or baseline rate of deforestation. The scale of subnational ERPs activities can vary widely and can range from a few thousand hectares to whole regions within a country. In countries, where multiple ERPs are being developed in close proximity, there is a risk that the environmental integrity of these projects could be compromised by potentially overlapping reference regions or baselines that do not add up. In addition, regardless of the boundaries of an ERP, where several projects are implemented in a region, state or province, project-level baselines need to be integrated at the regional (and eventually national) level to ensure the overall integrity of a REDD+ mechanism.

Policy rules should dictate how reference scenarios are calculated and verified, and how subnational ERP reference scenarios are integrated into regional or national reference scenarios. The registry can assist this process by recording spatially explicit reference scenarios and making them available for reference and consistency checking by subsequent developers of subnational, regional, or national reference scenarios. Three policy options are considered below.

- First, if the policy states a subnational ERP must have a reference scenario that is equal to or less than the regional or national reference scenario, this information can be checked when the activity is registered.

- Second, if the policy allows subnational ERPs to have reference scenarios that are higher than the regional or national average (e.g. because it is located in a hot spot), the registry can record both the rate and the geographic extent of the subnational reference levels. This can be weighted and logged against the regional or national reference scenario. For subsequent activities that are registered in the same region or country, the registry can automatically determine and publish the remaining average deforestation rates available. As an example, a region has an area of 100 km² and an average deforestation rate of 2%. A subnational ERP with an area of 10 km² and deforestation rate of 5% is registered. The registry can then re-calculate what the average deforestation rate is on the remaining forest to ensure the average within the region remains at 2%. This exercise can continue with each subsequent activity that is registered to ensure the sum of the subnational reference levels does not exceed the registered regional rate. This would be an extensive change in the way that registries have worked to date, but the registry is the natural provider of this function and as long as key data points and structures are designed at the outset, this kind of calculation could be done. Further research would be required to understand all key data points required to ensure environmental integrity and how these would be centrally, efficiently and accurately entered, updated and tracked by a national REDD+ registry.

- Third, a subnational ERP could be grandfathered into a subsequent regional ERP for a period of time (using one of the above methods). After this initial time period has expired the subnational ERP reference level would be automatically converted to the registered regional or national reference level.

Verification of reference scenarios along with assessing performance against regis-

tered reference levels can be done by private auditors or state authorities. This qualitative assessment should not be carried out by the registry.

Environmental Integrity: Risk management if emissions exceed reference scenarios

A REDD+ registry could support a number of policy options to address a situation where national emissions exceed a national reference scenario. A range of policy options that have been suggested are listed below. The purpose of including an option is to discuss how it could be supported by a registry. This section does not include any advice or commentary on which policy option is preferred over another and inclusion or exclusion of any particular option should not be interpreted in this manner.

A registry could be extended to record each country's emissions levels and therefore how many emissions occurred over the national reference scenario. This number would in effect be recorded in a negative account. Emission reductions in subsequent years could be used to offset deficits in previous years. Policy would determine the outcomes in such scenarios and this could be carried out in the registry. For example, a registry could have a rule in place to ensure that no national emissions are issued as units (or otherwise paid for) until past deficits are cleared. Alternatively, in a negative scenario, the registry could permit a deficit to be carried forward and reduced slowly over time to ensure some emission reductions or removals were being issued as units and income generated in subsequent years when they are generated.⁹

Alternatively, a registry could contain a national buffer / reserve account that could be drawn upon if national emissions exceed the national reference scenario. This buffer account would be filled from a percentage of units issued.

A third option is the cancellation or voidance of already issued units in an amount that corresponds to the deficit. A fourth and related option is periodic expiration of units, that are only re-issued if the performance is maintained. These last two options are similar to the CDM treatment of permanence in afforestation and reforestation projects via long-term CERs and temporary CERs respectively.

If subnational ERPs are issued REDD+ units and incorporated into a regional or national reference scenario, there is a risk that more units will be claimed by subnational activities than available based on the results of regional or national MRV. REDD+ policy will need to state how this is addressed, and may include reviews of subnational ERPs that claim successful performance to assess the accuracy of these claims. A registry can perform a number of functions that would be set by policy to address the implications this has on performing subnational activities:

- A registry could simply distribute the available units based on a pre-determined formula. For example, if 10 activities claimed 10 units each, but only 90 were available, the registry could simply transfer 9 units to the account of each subnational activity. The remaining deficit of 1 unit per activity could either be written off, or carried over and repaid in subsequent years if there is a surplus. This would require coordinated MRV and issuance.
- A buffer account could be established and drawn upon to transfer units to subnational activities that perform despite a regional or national under-performance. The buffer account could be filled with units that come from a share of national and/or subnational units previously issued. The buffer account could be specific to a subnational activity or region, or be a national buffer that receives contributions for a wider range of sources.

A challenge that may arise if REDD+ registries record a diversity of units is the possibility that different standards will adopt different approaches to dealing with this issue. For example, one standard may adopt a buffer / reserve approach, whereas another may prefer to cancel already issued units. This could be resolved either by establishing parallel procedures to track each option (which would increase registry complexity and costs) or policy decisions on a preferred approach in a given country.

Accountability: Operational processes and checks

Operational processes are important to ensure the integrity of documentation and that the requirements of government programs / donors are met. Operational processes provide the quantitative checks that technology cannot do efficiently or securely given the changing nature of the marketplace and the need for human confirmation or involvement. Wherever possible, technology could perform the required checks so as to reduce the risk of human error. However, for the foreseeable future, given the early stage of REDD+, it is likely that a combination of technology, rules and operational processes will be required to capture the required land use and ERP information on registries. In addition, a facilitative dialogue between the registry provider and the national program governing body (and potentially donors) ensures that procedural quantitative checks are completed as desired and therefore that the ERP complies with key requirements in the standard or program before the activity proceeds to results-based payment or unit issuance stage.

Operational processes and checks are required throughout all registry phases.

⁹ One interviewee claimed that if a country goes into deficit, an incentive is needed to reverse this trend. Reducing the deficit over time rather than as the first priority could be such an incentive that is supported by a registry.



**Accountability:
Compliance eligibility of units**

Some states or countries may allow REDD+ units to be used to satisfy regulatory obligations (e.g. as compliance units for their regional or domestic emissions trading systems) whereas others may not. It would therefore be valuable for a national REDD+ registry to track at issuance time whether or not the units issued meet regulatory standards (i.e. at issuance, it can be indicated whether the units are compliance eligible or not).

Accountability: Serialized units

A serial number for a REDD+ unit must be unique in that the same number can never be issued twice. Serial numbers also enable holders to access key information about the underlying environmental benefit that the unit represents. Serial numbers can contain a block number so that units issued from

an ERP at the same time can have their serial numbers aggregated into one number including the range of units. This range decreases as a block of units is separated and transferred. However, with this exception, the serial number would ideally remain constant.

While other financial market products use serial numbers,¹⁰ the serial number for REDD+ units can be more granular in that it can be concatenated in form and can therefore contain a lot more information at the serial number level than financial product serial numbers. A REDD+ unit serial number could provide a deeper level of information about the generation of that offset and the integrity of the documentation, processes, validation, verification and ultimately issuance. The serial number is therefore a key component of the credibility of tracking units. Most compliance units (including those issued under the Clean Development Mechanism) and most

¹⁰ For example shares, derivatives and other securities use 12-character alpha-numerical codes known as International Securities Identification Numbers or ISINs that serve as uniform identifiers at trading and settlement stages for the security type. Note however that while an ISIN is unique per share type (i.e. any issued share from a company bears the same ISIN code), serial numbers for carbon units are largely unique per issuance.

voluntary carbon units held in registries have unique concatenated serial numbers including a project identifier. This also allows the units to be easily identified for the purposes of replacement in the case of a non-permanence event (if needed). This approach regarding serial numbers could be applied to track REDD+ units as this would bring consistency, standardization, transparency and traceability to REDD+ units.

Serial numbers are not to be confused with "product identifiers" that identify the type of product being transacted (i.e. a VCU for vintage 2009 originating in Brazil for waste handling and disposal activities). Where serial numbers ensure integrity of issuance, product identifiers help streamline emerging markets, improving accuracy, integrity and operational efficiency, while providing increased transparency and liquidity. Product identifiers can therefore deliver value in the medium to longer term and could be a valid consideration for REDD+ architecture.

Operational efficiency: Access levels

Registries typically provide different levels of access to different users. The first level is access for users and account holders (individuals and organizations), where users have either "view only" access or active users have full user account access (enabling administration of the account, activity registration requests, issuance requests, transfers and reports). The second level of access in most registries is the "public view" where projects that are registered as public are viewable by members of the public, accessible via a website, and searchable based on variables. Finally, the third level of access is for registry administrators (whether countries in compliance programs or infrastructure administrators in other standards-based programs).

In addition to the three levels of access mentioned above, further levels of access could be established. For instance, where

approval by a national governing body is required for registration of an ERP, the national entity could be provided with "regulator access" to facilitate the approval process even though another entity is operating and administering the underlying registry system for them. In other words, the registry administrator does not have to administer the whole registry program for their jurisdiction as they can outsource this, but at the same time they can ensure that they have regulatory control to approve registration of activities, issuance of emission reductions, and even uploading of MRV documentation. The registry could be set up as to prevent an activity being registered as ready to generate emission reductions until approved by the relevant government authority. Approval could be facilitated electronically, transparently and efficiently. The same flexibility could be established for issuance or transfer approvals.

To ensure maximum operational efficiency with regard to registry access, access levels are required throughout all of the registry processes and phases.

Operational efficiency: Linkages across registries

As noted earlier, units will likely transfer or be recorded / transacted at various levels to facilitate the different activities occurring at the regional, national and international levels. The creation of data exchange standards will help facilitate such transfers efficiently and in an auditable and transparent way. Some data exchange protocols exist currently in carbon markets such as the inventory accounting processes that take place under the Kyoto Protocol and the Nostro/Vostro accounting in the VCS registry network. The financial market has numerous examples of such standards and could provide valuable input into a review of the various design options as applicable to carbon. Such protocols could be manual initially but would ideally be automated and

electronic as soon as volumes demand this to ensure continued operational efficiency and risk management.

Operational Efficiency: Document management

The REDD+ registry could offer an efficient document management and exchange service to all parties involved in the REDD+ activity so that key documents were accessible by all parties required (i.e. governments, donors, operators of emission reduction programs, the public etc). Such a tool could also be used to record all MRV documentation by both regulators and funders. To ensure maximum documentation management efficiency, a document management structure is required at least for phases 1 and 2 (registration and issuance) and potentially in phase 3 (to enable market activity).

Operational Efficiency: Reporting and auditability

In order to ensure real time transparency of ownership transfer and genuine tracking of units from REDD+ ERPs, all transactions would be time & date stamped, enabling a full audit trail of activity on the registry.

There are likely to be many parties involved in establishing a national REDD+ program, particularly in conjunction with subnational activities. Therefore, it could be advantageous for a national REDD+ registry to provide different levels of reporting for the actors involved. Flexibility around reporting would be advantageous. Different kinds of reporting requirements could include internal reporting, government compliance reporting, and auditing. To ensure maximum reporting and auditability of documentation and information in the registry, this reporting function is required at all three registry phases.



Transparency: Tracking safeguard compliance and co-benefits

The kinds of information relevant to REDD+ that could be captured at the standard or country level could include ERP reference levels, estimated emission reductions, permanence requirements, methodology types, and whether local or national forest laws require certain information to be captured for example. This kind of tracking would ensure flexibility while also facilitating transparency and efficient access to such information as required by users.

In addition to this, a registry specializing in REDD+ ERP tracking could also track safeguard compliance and co-benefits. This may include recording compliance with benefit-sharing arrangements (when these are precisely defined in national rules or under the chosen standard or international program), with procedures for local communities' involvement and participation in ERPs, and with any specific requirements applicable for ERPs taking place in indigenous lands.

Where a REDD+ ERP delivers benefits in addition to core carbon sequestration, the registry could record those benefits, whether as additional environmental attributes or as additional certifications (examples of voluntary certification standards include the Climate, Community, & Biodiversity Standards, Social Carbon, and the REDD+ Social and Environmental Standards). Certification of units under these additional certification standards signifies that the delivery of those additional environmental benefits meets the criteria set out in those standards.

Regulatory Aspects

A REDD+ registry could be created as part of a broader national REDD+ strategy and would ideally be placed in the context of the legal and institutional framework established to govern and oversee the implemen-

tation of the REDD+ program(s). In order to promote participation and access, the procedures and guidelines for the operation of the REDD+ registry should be based on simple, transparent, and expeditious rules. Issues to be dealt with through these guidelines and procedures may include: (i) relevant institutional arrangements for the operation of the registry; (ii) verification of information and approval procedures; (iii) authorized participants; and (iv) effect on title and rights to REDD+ benefits.

Institutional arrangements

National procedures and guidelines should define the institutional arrangements required for the operation of the national REDD+ registry. This will include registry requirements and appointing an authority to oversee the operation of the registry.

The entity responsible for overseeing the registry and its operations could be the same as the entity responsible for other aspects of REDD+ in the country. In this case, the same national entity in charge of, inter alia, endorsing reference levels, enacting guidance for stakeholder participation, and approving REDD+ subnational activities could be tasked with supervising the registry operator. Alternatively, the country could outsource the role of supervising the registry operator to a third party, such as a board or private entity (that may work under the authority and guidance of a national entity and pursuant to agreed operational procedures).

Having the registry operator accountable to a national authority would help countries ensure the registry operates in accordance with relevant regulations (this could be done by legislation or by contract). Domestic law may place restrictions on whether or not regulatory functions can be outsourced to entities outside the government, making this the default option.

Some countries may, however, opt to outsource the role of the registry operator to a third-party provider. This could be useful if the country does not possess the technological, financial, infrastructural or human resources capacity to design, build and operate this type of electronic database on a daily-basis. Additionally, such infrastructure requires continued investment which third party providers are generally best placed to provide. Legally, outsourcing the role of a registry operator to a third-party provider may be less of a problem as the registry would not be designed to take qualitative decisions, but simply to record and register information in accordance with agreed procedures and standards.

Whoever operates the registry, the operator must avoid conflicts of interest or improper influences when carrying out its administrative functions, enable third party/regulator access and approval where required, ensure data integrity and registry security (e.g. against fraud or theft) and guarantee long term data capture, auditability, storage and retrieval.

Verification and Approval

Auditing and approval procedures are typically required to ensure authenticity and accuracy of information prior to its inclusion in a registry system. National procedures and guidelines could establish the entities responsible for carrying out the verification of the information to be recorded and the approval of ERPs.

Verification is normally carried-out by independent auditors following pre-agreed and established standards, while in the compliance market final approval is left to a regulatory body.

- One option for countries would be to follow this approach and design the REDD+ registry in a manner in which only information verified by an independent

auditor and subsequently approved by the competent national authority would be recorded and uploaded (this could be done even with a third party registry provider using the 'regulator log in' function outlined in section Potential REDD+ Registry Design Features above).

- A second option is to have the verification and final approval functions consolidated with the appointed national authority that communicates with the registry.
- A third option could be to have the registry operator performing verification of information and deciding on the registration of activities in the REDD+ registry.

The first two options place the least administrative burden on the registry and promote registry efficiency and cost effectiveness. Having an independent auditor undertaking verification (first option) may also promote greater transparency in relation to the quality and accuracy of the information recorded in the registry. National guidelines and procedures could determine the scope and extent of auditing and approval requirements.

Consolidating verification and approval functions with the national regulatory authority (second option) could create the appearance of conflicts of interest and raise doubts as to the transparency of the data recorded in the registry. The second option risks increased costs for governments and risks delays if there are restraints on resources.

The third option, i.e. to house verification and approval of information with the registry operator, will place additional demands on the registry that would increase time, increase costs and decrease efficiency.

However, where in option one an independent auditor undertakes verification, the REDD+ registry operator may complement the data evaluation process by, for instance, double-checking some of the information

asserted in the documents such as the geographical coordinates of the project against its project database and cross-referencing electronic information with that provided by authorized real estate notaries and environmental authorities. The first of the options is therefore recommended if registry efficiency, independence and cost effectiveness is a priority.

Authorized Participations and Accounts

National guidelines and procedures will need to specify the entities authorised to request the recording of information in the registry, registration of subnational activities and the creation of electronic accounts for the purposes of holding and transferring REDD+ units (in the event the creation of tradable units is possible).

Depending on whether subnational actors are allowed to formally participate in REDD+, the national registry could be designed to allow states, provinces, or municipalities to request information on subnational activities be recorded. The national REDD+ registry could house the national account, an electronic account for each subnational government, as well as other relevant accounts such as the buffer reserve, retirement and cancellation accounts. The national registry could also accept requests to record information and open accounts from non-governmental actors, including NGOs, local communities, farmers, and private companies.

If the scale of REDD+ implementation is restricted to national level efforts only, the national REDD+ registry would be able to record information related to national policies and programmes only. If REDD+ units can be issued for emission reductions achieved nationally, an electronic account could be established to hold and transfer these units.

Title to REDD+ units and financial flows

Title to REDD+ units may be unclear in some jurisdictions and matters directly impacting title, such as land tenure, rights to forests, rights to forest products, and who has fundamental rights to carbon, will have to be resolved by law and policy outside of the registry. The extent to which the registry can demonstrate legal ownership will depend on the applicable legal framework in place. However, once clarified, the registry may assist in transparency by recording title to REDD+ units as determined, which may in turn support transparent sharing of benefits and/or payments based on documentation provided to the registry.

Most countries operating a compliance carbon program under the Kyoto Protocol will have integrated the role of the national registry into their legislative framework, thereby giving the ownership information in the registry a status similar to that of securities registers: i.e. units issued and recorded on the registry are prima-facie evidence of legal title. The units therefore belong to the authorized participants who have successfully obtained registration or issuance of the units based on the proof of ownership information supplied by the account holder. In this scenario local law would first determine who is authorized to request registration of units, as such registration would carry with it title to the units. Alternatively, the legal framework and / or the REDD+ registry may be silent in respect of ownership and title to REDD+ units. In this case, the registry would simply record who has registered the unit while remaining silent on whether or not the account holder, by virtue of holding the units, has absolute title to the units (i.e. recording units in the national registry would not serve as evidence of title to REDD+ units or benefits). Final determination of title and ownership would still need to be determined through the existing host country laws. While possible, this second option may, however, lead



to confusion and increase uncertainty over title to registered units rather than help clarify it. Either option would not prevent one legal entity opening a registry account and holding units, while at the same time doing so on behalf of a larger group of local stakeholders who may not all be individually listed as account holders.

Related to the question of title, the registry could identify and list the indigenous groups, local communities and/or landowners receiving payments for their efforts in protecting and preserving the forest and in reducing forest-related emissions. The registry could also track payments made from international funding mechanisms to the national government and, if applicable, the re-allocation of these resources domestically.

One relevant feature of a REDD+ registry that may assist clarifying title to REDD+ emission reductions (or units) and identify the correct recipients of REDD+ payments would be the ability of cross-reference electronic information available on the property or land with other authorities in the country. In some countries, real estate notaries and environmental authorities have in place digitalized systems that provide detailed information about the geographical boundaries of a property, land ownership (including encumbrances on the land and a history line of ownership changes), demarcated indigenous lands, and compliance with preservation areas, among others. Communication between the REDD+ registry and environmental authorities and real estate notaries could provide further assurance in relation to natural resource ownership.

These communication links with environmental authorities and notaries could also allow the REDD+ registry to identify when the REDD+ activity is developed within or nearby indigenous lands and areas defined for use of traditional communities. This may be helpful when dedicated benefit sharing arrangements and stakeholder consultations apply for REDD+ initiatives developed on lands occupied by indigenous lands and traditional communities. This could also facilitate in identifying the correct recipients for REDD+ payments at the subnational level. If domestic laws allow for carbon rights to be created separately from land and forest resources, the appropriate entity would also need to verify the documents assigning title to REDD+ units from the original owner to new ones.

Given the potential number and variety of types of authorities, notaries and underlying databases, in addition to the potential language barriers (where a third party registry provider was involved), tasking a REDD+ registry with performing this cross check with other domestic registries would increase operating costs substantially (given the cost to integrate the registry across numerous different types of databases) and would reduce efficiency of a REDD+ registry. It simply may not in many cases be practical to require the registry provider to undertake such cross-referencing. In addition, establishing these connections will take a long time, which will potentially delay the launch of the national REDD+ registry system. It would without doubt be simpler, faster, and more efficient if REDD+ policy tasked third party auditors with this function, and simply required the results of this check to be recorded in the REDD+ registry.

Regional Registries

A country may allow the establishment of regional REDD+ registries along with a central registry. Regional registries would play

essentially the same role of the centralized one, but focused on subnational activities taking place within the state/provincial jurisdiction. These regional REDD+ registries would need to comply with common central registry guidelines and procedures to ensure consistency of registry functions, integrity of data format and adequate communication links between the registries. Alternatively, regional activities could be housed within a registry that is capable of listing many different standards in one system, avoiding the risk of silos.

The existence of regional registries may require further technological capacities at the state or provincial level. They may, on the other hand, allow for some tailoring to regional policy, circumstances and needs. However, common rules and guidelines would be required to ensure consistency in the information recorded in the regional registries and data format (for comparability purposes), and it would be important to avoid the risk of silos whereby critical information is difficult to access from various different systems if they each operate differently. Note that registries will need to provide flexibility as to what information is captured at the various regional levels as compared to that at the national level. This could be done on a standard-by-standard basis.

Early Action Incentives

REDD+ efforts carried out before the formal establishment of a national REDD+ accounting framework are normally referred to as early action efforts. Developing countries supporting the implementation of REDD+ at the national (as well as subnational) level may wish to set-up an incentive structure to promote early action during an interim-phase. The main objective of these early incentives is to attract local governmental and non-governmental actors to participate in REDD+ activities to develop

experience, test new concepts, increase private sector interest, and allow for prompt delivery of real and measurable emissions reductions (and removals). Given that for most developing countries REDD+ national accounting and monitoring is only expected within 5 to 6 years from now, it becomes relevant to look into some of the features and functions of a national REDD+ registry during a transition period to a national REDD+ system.

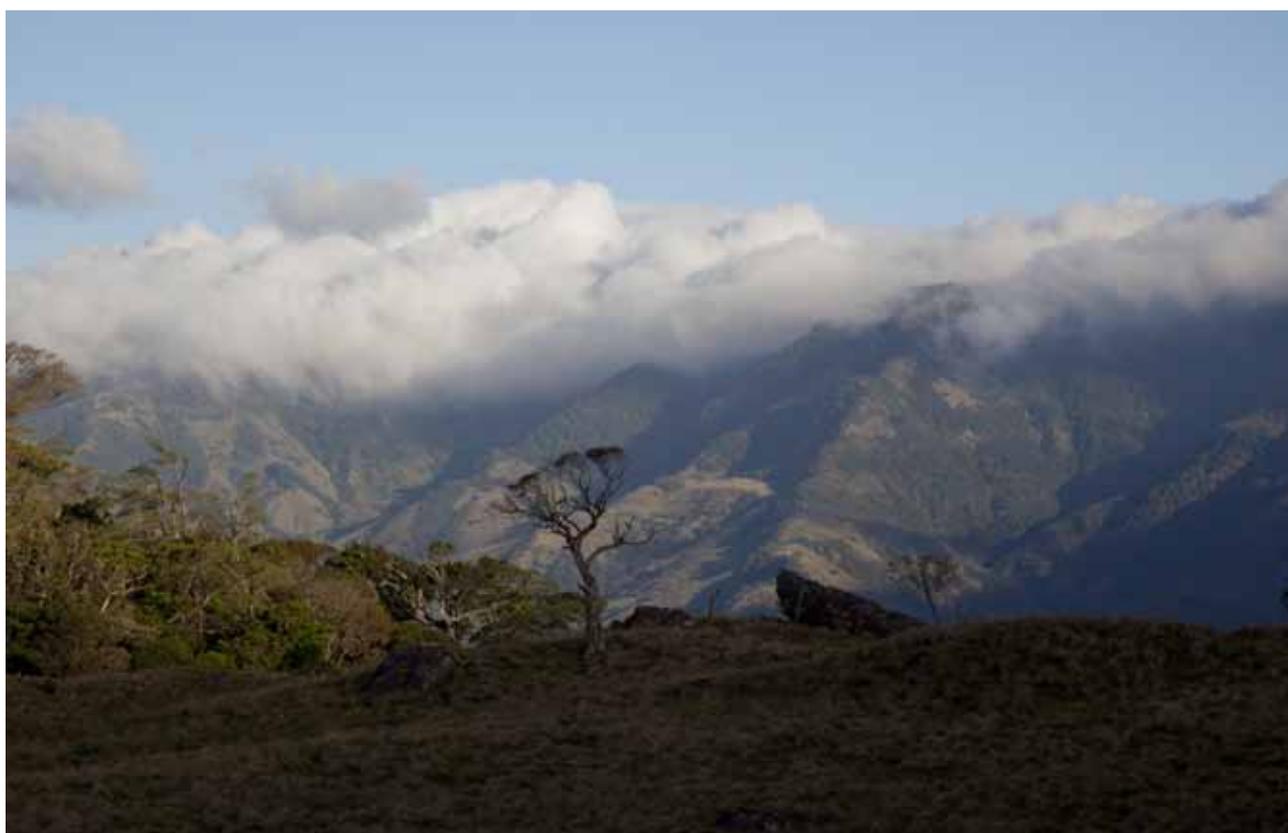
Compilation of Information

During an interim phase a national REDD+ registry could serve as a repository of relevant information to assist in the promotion of voluntary activities. The national REDD+ registry could document all voluntary activities taking place within the country, including information about their geographical position, voluntary standards applied, GHG reduction estimates, and baseline elements.

The REDD+ registry could also make available relevant technical information to assist subnational governments and non-state actors in developing their voluntary activities. These could include key parameters that would need to be factored-in when elaborating project-specific baselines, subnational reference levels, and MRV procedures.

Countries could decide to simply shadow existing voluntary activities in the REDD+ registry (as outlined in section Potential REDD+ Registry Design Features above) or, alternatively, establish an evaluation procedure to "pre-approve" for inclusion in a future national reference scenario the activities which take into account the technical requirements made available through the REDD+ registry. After receiving the preliminary approval from the relevant national authority, these activities could be registered in the REDD+ registry.

The compilation of relevant REDD+ information in a structured manner would



increase transparency, facilitate in-country coordination of early REDD+ efforts, and encourage private sector involvement. In particular, the listing of key technical information in the registry would assist local actors in developing REDD+ subnational activities that are in line with the criteria being considered by national and subnational governments for their respective reference levels. Whether voluntary activities are simply listed or pre-approved may have an impact on the likelihood of this activity (and its emission reductions) being recognized under a future compliance regime. Countries could also opt to enact minimum social and environmental standards applicable to voluntary activities that wish to be considered under a future compliance regime as discussed above.

Grandfathering Early Action Efforts

Countries may need to define under what conditions voluntary activities listed in and

emissions reductions tracked through the REDD+ register during an interim phase can be grandfathered into the national REDD+ system once established.

One option could be to allow all voluntary activities and units registered in the REDD+ registry during an interim phase to be recognized in a future national regime. Under this scenario, registration of a voluntary activity in the REDD+ registry would automatically mean that this activity would be accounted for in the elaboration of the national and/or subnational reference level and its emission reductions (achieved and to be achieved) validated for the purposes of the compliance regime.

Alternatively, the country could decide that registration of voluntary activities would merely imply a commitment of the government to consider (on a case-by-case basis) the opportunity and merits of each early REDD+ activity at the moment the national

system is adopted. Whether or not an activity listed in the REDD+ registry during the interim phase would be grandfathered and to what extent its emission reductions would be recognized, would be thus left to a later stage. Each country would define its own rules and procedures in relation to grandfathering voluntary activities. The more certainty these rules provide in relation to the future recognition of early REDD+ efforts and emissions reductions, the greater the willingness of local actors will be to develop voluntary activities.

Allowing for automatic recognition of all voluntary initiatives would certainly provide that assurance to local actors, but could expose the national government to the risk of having to grandfather activities which cannot realistically contribute to achieving the national reference level. To mitigate this risk, an option would be to allow only those voluntary activities that make use of the minimum technical requirements listed in

the registry to be registered. The registry operator could perform that check and inform the national authority of the result, after which a decision on the registration of the voluntary activity would be taken.

Finally, early action subnational activities also need to be considered in future regional or national reference scenarios to avoid perverse incentives. Perverse incentives to discourage early action could occur if successful subnational activities adversely affect subsequent regional or national reference scenarios. While determining regional or national reference scenarios will set by policy, a registry can provide information for these calculations if needed.

Cost Considerations

Given the wide variability of design options outlined in this report, the high level at which they are outlined, and the phased nature in which they may be delivered to different countries at different times, it is not possible to estimate costs to build a new national REDD+ registry that reflects either some or all of the options. Equally, it is not possible to estimate the potential range of costs to adapt existing registry infrastructure to meet these requirements. To be accurate, this would require a detailed technology review of all existing registries on a country by country basis, as compared to the broad requirements outlined in this report; a task outside of the scope of this report.

However, carbon registries have been operational in the compliance and voluntary carbon markets for almost a decade and the number of providers of registry infrastructure is relatively small. Therefore, once policy and governmental requirements are further refined at the national (or program) level, obtaining quotes from the various providers could be achieved easily.

It is important to note that the manner in which the registry is operated and the underlying business model being utilized by each country will be relevant when considering cost. For example, the upfront costs to build a customized national REDD+ registry for one or more countries to own and operate (with no ongoing maintenance costs) may be higher than the upfront costs to retain a registry provider to develop, operate, and charge ongoing hosting, maintenance or user fees to manage a REDD+ registry over time. Equally, fee considerations are important when taking into account the kinds of behavior that the program coordinator is seeking to achieve. For example, user fees based on transactional activity may reduce the upfront costs for governments but deter participation on a regular basis by local organizations. On the other hand larger upfront development costs may result in lower transaction fees, thereby encouraging maximum participation by local entities. Alternatively a combination of set up and user fees may meet the considerations for the relevant country or program.

In summary, types of fees charged could range from one-off upfront fees, to annual hosting, maintenance and operational fees, to volume-based transactional fees, whether for national governments or other users or both. Compliance market registry providers are traditionally software companies that charge set-up and ongoing maintenance fees to the host country which operates the system themselves. Users are generally not charged as they are either required by law to utilize the registry system (being compliance entities) or they are sellers/intermediaries. However, voluntary market registries have traditionally operated the infrastructure for the users and so have charged users on a volume basis. These two registry worlds are increasingly overlapping and some voluntary market registries are working with country and state governments to implement tailored carbon infrastructure for a set up fee and sometimes a smaller volume-

based fee also (whether for REDD+ or other carbon programs).

Volume-based fees in voluntary registries generally include: (i) a nominal account maintenance annual fee per user (approximately USD\$600); and (ii) fees relating directly to transactional volume of the units in questions i.e. a small fee is charged for each unit issued, transferred and/ or retired (ranging from US2c-10c depending on the relevant standard). Whether the buyer or the seller pays the fees depends on the voluntary registry in question but in reality, this is priced into the transaction and there is little price asymmetry in the market. Inter-registry transfers can also be priced as there is not yet complete automation within the voluntary carbon market between different registry providers.

Volume based charges for users may delay uptake in proper tracking of ERPs, and if governments are not directly involved, volume-based charges payable by them may lessen their desire to fully utilize the system. Aggregating donor funds for set-up and initial operation and maintenance will likely better ensure that the system is delivered to requirements upfront and ERP proponents and other participants will maximize it from the outset, thus ensuring efficiency, transparency, accountability, and environmental integrity are maximized from the outset. In addition, to minimize time to launch and development costs, it would be prudent to leverage existing registry infrastructure that already has a lot of the flexibility and capabilities outlined in this report.

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