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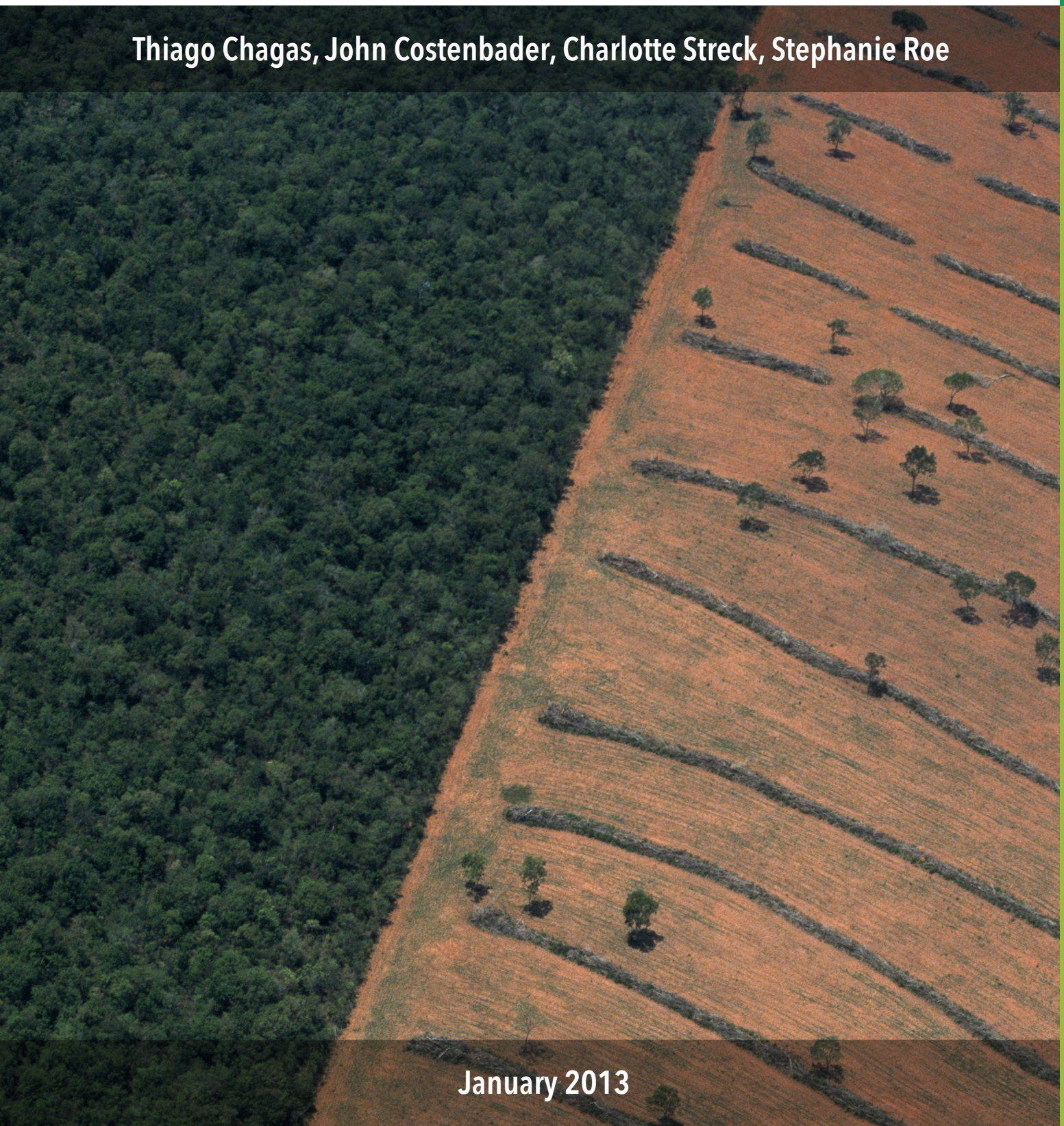
Reference Levels: Concepts, Functions, and Application in REDD+ and Forest Carbon Standards

Thiago Chagas, John Costenbader, Charlotte Streck, Stephanie Roe



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Thiago Chagas, John Costenbader, Charlotte Streck, Stephanie Roe

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Executive Summary

Results-based payments for REDD+ efforts will require measurement and quantification of performance — and therefore, the construction of reference levels (RLs). RLs set a performance benchmark for mitigation activities by providing a reference point, or baseline to which current and actual efforts can be compared throughout a pre-determined timeframe. Consequently, RLs are strongly linked to measurement, reporting, and verification (MRV) of mitigation efforts.

The establishment of RLs is required by a number of standards and initiatives that promote the reduction of deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) and mitigation activities in the land-use sector in general. REDD+ and forest RLs are comprised of a common set of substantive elements (e.g., scope of activities, scale of accounting, carbon pools included, and methodologies) and procedural elements (e.g., submission, approval, review, and underlying procedural principles).

Looking at how these common substantive and procedural design features are structured under each regime can help clarify particular functions of RLs and place the RL discussion in an appropriate context. This paper seeks to assess how different results-based initiatives deal with common RL design problems in order to inform REDD+ negotiations and policy makers. It is also intended to serve as a reference for a consolidated overview of options for constructing RLs, and enhance understanding of how their different forms and function will impact the overall design of REDD+ mechanisms.

Substantive design features

The scale of REDD+ initiatives determines whether RLs are set for the territory of a jurisdiction (e.g., country, federal, state or administrative region), or whether it applies to an area defined by the boundaries of a particular intervention, such as a project or program. National approaches are by definition implemented at a national-level jurisdiction. Subnational approaches, in turn, can refer to a project, program, or a subnational jurisdiction.

Project-scale standards differ in their objectives and concerns from jurisdictional and/or national efforts, resulting in divergent approaches to each RL. Project-scale standards, like the Clean Development Mechanism (CDM), the Verified Carbon Standard (VCS), and the Australian Carbon Farming Initiative (CFI) are mostly concerned with the creation of tradable offsets. Incentives at larger scales (i.e., jurisdictional or national), on the other hand, are created through government initiatives and/or bilateral and multilateral negotiations and tend to involve a more complex set of objectives including those set in the United Nations Framework Convention on Climate Change (UNFCCC).

The scope refers to the activities that are covered in the RL (e.g., avoided deforestation, forest management, afforestation, conservation). Most project-scale standards outline specific methodologies on how to establish baselines for each activity. The scope of jurisdictional REDD+ consists of various activities, adding significant complexity to developing RLs. Therefore, entities that develop jurisdictional REDD+ RLs are often given the flexibility to start accounting for avoided deforestation, and then as capacities, systems and available data improve over time, incorporate additional activities (or categories).

The RL methodology is specified according to each standard and details how emissions and removals will be calculated and what carbon pools, data, models and assumptions will be used. With respect to methodological approaches, an explicit distinction applies between a "business-as-usual" RL, which is a forecast of projected rate of changes in carbon stocks and GHG emissions for a given time period and a "historic" RL defined as the historic level of the rate of changes in carbon stocks and GHG emissions over some time period in the past. Generally, in systems and countries with long data series, little carbon fluxes and long-term policies, project RLs rely on historic data only (e.g., Japan, New Zealand). In these systems, RLs are built on national/regional forest inventory data. Most other standards, including jurisdictional REDD+ standards as well as most voluntary project offset standards, use business-as-usual (BAU) RLs. Most project level standards will define quality criteria for data, data collection, and emissions calculations, with specific guidance and additional data requirements defined for each project type separately. Jurisdictional REDD+ standards often rely on the building of improved data series over time.

Finally, most standards and initiatives require consideration of additionality, in particular where such efforts are used to offset emissions elsewhere. Project-scale standards tend to require that activities are supplementary to those occurring otherwise. Such an approach is difficult to apply to higher scale RLs, where additionality is often internalized into conservative RLs.

Procedural design features

Many standards reviewed in this report are built on the principles of transparency, consistency, completeness, accuracy, and comparability. In addition, depending on the objective and purpose of the relevant standard or initiative, some procedural principles may gain greater emphasis.

Procedures for approval of reference levels differ from bottom-up processes that allow flexibility in proposing RLs (such as the CDM, the VCS, and Plan Vivo) to top-down, mandated baselines (such as the California Offset Forest Protocol and the New Zealand PFSI). Bottom up processes include submission of RLs with either a centralized technical approval process (e.g., the CDM) or a political/negotiated endorsement process (e.g., forest management RL under the Kyoto Protocol).

Standards that use bottom up processes may have criteria for approving baseline methodologies and/or detailed guidance. Top-down systems are more common in domestic law-based standards, where a central authority is tasked with the role of determining the RL. Rules are very prescriptive and participants have little flexibility in this process. RL review procedures may be classified according to similar processes as those providing for initial approval. Generally, bottom up standards with a centralized approval process provide for limited validity periods, which automatically result in review and re-validation according to pre-determined criteria. RLs determined by bottom-up submission with negotiated or endorsed processes have only minimal criteria relating to renewal or re-validation, but may require a new negotiation regarding any adjustments.

Conclusions

Although RLs in all the existing standards and initiatives share a core foundation (the idea of a performance benchmark or reference point for measuring results of mitigation efforts), they often have different nuances and functions depending on the context in which they apply and the purpose they serve. This includes how the standards or initiatives seek to achieve environmental integrity, the type of regime or process in which the

standard or initiative is born (mandatory or voluntary, international or domestic), to what extent the standard or initiative will have a role in the carbon market, and whether social aspects are taken into consideration.

Environmental integrity differs in regard to the level of focus of the various RL types. In project-level RLs, the focus of environmental integrity analysis is on the individual project. RLs for jurisdictional-level standards ensure integrity through conservative RLs, transparent RL construction and review, and a broader accounting scale to mitigate leakage risk. Under law-based standards, the environmental integrity of RLs is determined at a programmatic level via an emphasis on overall mitigation objectives.

The substance and procedures of various RLs are determined in part by market-related considerations as well. Domestic law-based standards that supply offset markets focus on preventing an overabundance of carbon offsets. This is due to their concern in flooding the carbon market with forest carbon and other offsets, enabling an overly cheap carbon price and consequently undercutting overall mitigation actions. Some law-based standards have discussed achieving this via steep reductions in sectoral RLs or crediting baseline targets. Voluntary standards are not concerned with quantitative issues but rather maintaining conservative RLs in order to achieve high quality credits while allowing a broad scope of eligible activities. Regional standards may exhibit other market considerations, including ensuring the scope of activities align with local needs and the development of local capacities.

Acronyms

Acronym	Name	Acronym	Name
A/R	Afforestation/ Reforestation	FCPF	Forest Carbon Partnership Facility
AB	Assembly Bill (California)	FSC	Forest Stewardship Council
ACR	American Carbon Registry	GCF	Governors' Climate and Forests Task Force
AFOLU	Agriculture, forestry and other land-use	GDP	Gross Domestic Product
ALM	Agricultural Land Management	GHG	Greenhouse Gas Emissions
ARB	Air Resources Board (USA/CA)	GOFC	Global Observation of Forest and Land Cover Dynamics
ARR	Afforestation, Reforestation and Revegetation	JNR	VCS Jurisdictional and Nested REDD+
BAU	Business as usual	J-VER	Japanese Offset Credit Scheme
BOCM	Bilateral Offset Crediting Mechanism (Japan)	IPCC	Intergovernmental Panel on Climate Change
CAR	Climate Action Reserve	LCDS	Low Carbon Development Strategy (Guayana)
CDM	Clean Development Mechanism	LULUCF	Land use, Land-Use Change, and Forestry
CER	Certified Emission Reduction (CDM)	MRV	Measurement, Reporting, Verification
CFI	Australian Carbon Farming Initiative	NZ	New Zealand
CMP	Meeting of the Parties (Kyoto Protocol)	PFSI	Permanent Forest Sink Initiative (NZ)
COP	Conference of the Parties (UNFCCC)	REDD	Reduced Emissions from Deforestation and forest Degradation
CRT	Climate Reserve Tonnes (CAR)	REDD+	REDD and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks
DOE	Designated Operational Entity	RL	Reference Level
DOIC	Domestic Offsets Integrity Committee (AUS)	RGGI	Regional Greenhouse Gas Initiative (USA, North East)
ER-PINs	Emission Reduction Project Idea Notes	SFM	Sustainable Forest Management
ERT	Emission Reduction Tons (ACR)	UNFCCC	United Nations Framework Convention on Climate Change
ERU	Emission Reduction Unit (JI)	US	United States of America
ETS	Emission Trading System	VCS	Verified Carbon Standard
FAO	UN Food and Agricultural Organisation	VCU	Verified Carbon Unit (VCS)
FC/FU	Forest cover/forest use	VVB	Validation/Verification Body (VCS)

1. REDD+ Reference Levels: Definitions and Function

Results-based payments are intrinsically connected with measuring and quantifying the performance of particular activities and actions. Such measurement of results requires the establishment of a reference scenario. The reduction of emissions from deforestation and forest degradation, or increase in sequestration through improved forest management or enhancement of forest carbon stocks, is often measured against forest reference levels or forest reference emissions levels (RLs).[1] RLs set a performance benchmark for mitigation activities by providing a reference point to which current and actual efforts can be compared throughout a pre-determined timeframe. Consequently, RLs are strongly linked to measurement, reporting, and verification (MRV) of mitigation efforts.

The establishment of RLs is required by a number of standards and initiatives that promote the reduction of deforestation and forest degradation, the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+), and mitigation activities in the land-use sector in general. Such standards include the voluntary and domestic compliance project-based mechanisms, international multilateral or bilateral regimes, and national cap-and-trade programs.

Standards that create offset credits often define RLs as business-as-usual (BAU) baselines that take into account historic data and extrapolate these into the future. Wherever necessary and justified, these extrapolations may be adjusted for projected events that, at the jurisdictional level, are often referred to as "national circumstances."[2] BAU baselines refer to the projected quantity of greenhouse gas (GHG) emissions, or the net amount of emissions after subtracting removals, without any mitigation action. In the context of regulated emission trading systems, project or jurisdiction-specific RLs are often replaced by simpler benchmarks (such as carbon stocks determined in a fixed year or range of years) that reduce transaction costs and apply throughout the regulated system.

The other term often used in the context of REDD+ RLs is "Crediting Level." The Crediting Level is understood in the context of an international REDD+ mechanism as the amount of emissions below which a country, jurisdiction, or subnational program qualifies for international support in a GHG results-based REDD+ system. Project-based standards normally do not differentiate between the measurement of GHG effects and crediting thresholds. They may limit the quantity available for trade however, through required buffer or reserve amounts that cover the reversal risk.[3] Even where this is the case, project standards are mostly concerned with accounting for the GHG reductions or removals, and issue carbon credits accordingly. National and jurisdictional REDD+ RLs achieve a more complex set of objectives: they seek to provide incentives for country participation in a multilateral system (thereby broadening the geographical coverage of the mechanism and avoiding international

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1 RLs are generally used in the context of REDD+ to estimate the amount of emission reductions from deforestation and forest degradation, as well as the amount of removals from sustainable forest management and enhancement of forest carbon stocks in a geographical area. Reference emissions level (REL), in contrast, often is used to refer to the amount of emissions from deforestation and forest degradation from a geographical area (REDD only). In the rest of this report, we use RL as shorthand to indicate both reference levels and reference emission levels unless otherwise specified.

2 See UNFCCC, Decision 1/CP.16, FCCC/CP/2010/7/Add.1, par 70.

3 While technically distinct from a crediting baseline, the analogy can be made to the extent that buffer mitigation mechanisms set aside a portion of emission reductions and removals effectively achieved by the relevant mitigation activity to cover for risks of carbon that may be lost or released back into the atmosphere. Standards adopting a buffer mechanism include the Verified Carbon Standard, the Climate Action Reserve, and the American Carbon Registry.

leakage) while economizing the use of limited resources by ensuring that the funds are spent efficiently to meet the costs of additional efforts. Since the establishment of RLs is intrinsically linked to the provision of support and financial incentives for REDD+ action, a distinction between a RL that accounts for emissions and a Crediting Level that creates financial incentives makes sense. However, hardly any standard has specified the details on how to determine a Crediting Level for the purposes of financial rewards.[4]

RLs are often comprised of a common set of substantive and procedural elements and design features. From a substantive standpoint, the most important design features include the scope of activities, scale of accounting (national, jurisdictional, project), carbon pools included, methodologies for calculation, data used and the types of adjustment factors allowed in the construction of RLs. The procedural aspects, in turn, emphasize the process through which RLs are submitted, approved, and reviewed, including, for instance, the manner of RL determination (top-down, bottom-up, or a hybrid approach), guiding procedural principles and periodicity of review.

Looking at how these common substantive and procedural design features are structured under each regime, that is, which elements are factored in and which are excluded from the varying standards and processes, can help better understand particular functions of RLs and place the RL discussion in an appropriate context. This paper seeks to assess how different results-based initiatives deal with common RL design problems in order to inform REDD+ negotiations and policy makers. It is also intended to serve as a reference for a consolidated overview of options for constructing RLs, and enhance understanding of how their different forms and function will impact the overall design of REDD+ mechanisms. Section 2 of this paper will compare the substantive design elements of results-based forest standards and REDD+ initiatives. Section 3 will do the same but focus on procedural and formal elements. Section 4 will summarize the authors' analysis of how various design features relate to the objectives and context of the reviewed standards.

This study has been developed in the context of a ClimateWorks-funded effort to enhance transparency within public and private REDD+ standards and initiatives. Our analysis is informed by the acknowledgement that it is becoming increasingly difficult for individual stakeholders to track the progress in the various venues that promote REDD+ standards and create the foundation for results-based payments. The lack of venues that facilitate information sharing is an obstacle to leveraging the body of knowledge, approaches, practical experimentation, and lessons learned that is currently evolving—often in a stove-piped fashion. This paper is the second in a series of analytical papers that compare main design features of forest carbon standards and REDD+ initiatives. The first paper, "Standards for Results-Based REDD+ Finance, Overview and Design Parameters" by Charlotte Streck and John Costenbader, was published in December 2012. The current paper presents a deeper analysis of establishing RLs within the REDD+ standards and initiatives presented in the first paper.

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4 An exception is the California cap-and-trade program, which provides some of the requirements for the determination of "Crediting Baselines" for the purposes of approving and issuing REDD+ sector-based credits for activities taking place in developing countries. Jurisdictions willing to have their programs approved by the Californian program will have to define a crediting baseline that represents a reduction in GHG emissions from the BAU scenario or reference level and make use of transparent systems for defining such crediting baseline and reporting emissions reductions reach exceeding it. See Subchapter 10 Climate Change, Article 5, Sections 95800 to 96022, Title 17, California Code of Regulations, Article 5, Dec 2011, California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms (hereafter "California Cap-and-Trade Law"), Section 95994, " Requirements for Sector-Based Offset Crediting Programs", and Section 95972, "Requirements for Compliance Offset Protocols." Available at: http://www.arb.ca.gov/regact/2010/capandtrade10/candtmodreg.pdf.

2. Technical Design Features

Technical design elements, such as scale, scope, carbon pools, methodology and data sources, are vital for REDD+ to create rigorous and effective programs to reduce emissions and enhance carbon removals. In this section, we will review the technical elements of RLs with a particular focus on the function of the various features in the context of the reviewed standard. We will review the scale and scope of RLs, the elements needed to construct RLs, the methodologies applied and the need of a separate additionality test.

2.1. Scale

The scale of REDD+ initiatives determines whether RLs are set for the territory of a jurisdiction, such as an entire country, federal, state or administrative region, or whether they apply to an area defined by the boundaries of a particular intervention, such as a project or program. Whereas national approaches are per definition implemented at a jurisdictional (e.g., national) level, subnational approaches can refer to a project- or program-level, or to a subnational jurisdiction. REDD+ initiatives often may also limit their geographical eligibility (i.e., regional standards[5]) or limit their contractual scope to a particular region (i.e., bilateral initiatives[6]).

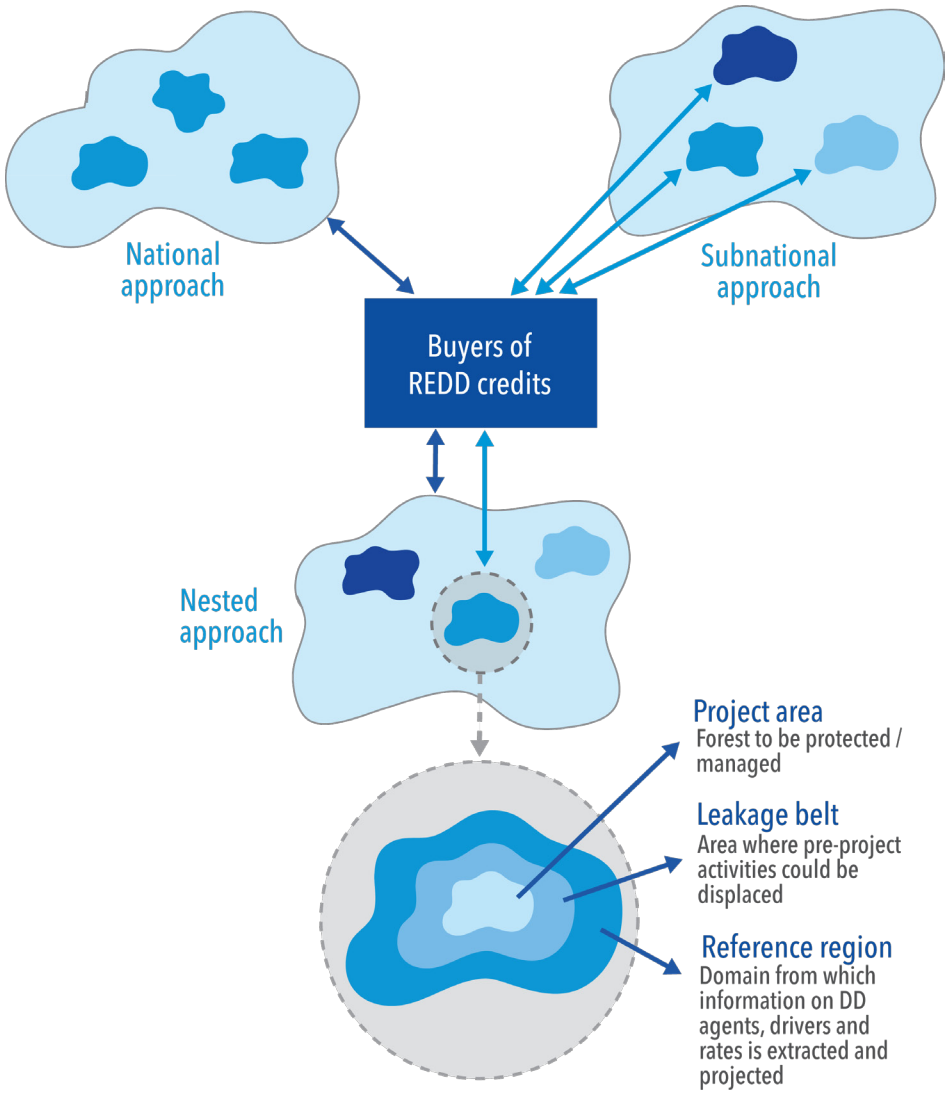
At the national level, a BAU RL is critical to measure the impact of REDD+ interventions, such as national policy reforms and other national government actions. The comparison of a country's performance against a RL will inform national and international stakeholders about the effectiveness of REDD+ policies, and help in the design and implementation of future ones. Subnational RLs are essential to assess the effectiveness of REDD+ action at the subnational jurisdictional, policy, program and project levels.

The RLs profiled here have been developed for divergent purposes, reflecting the objectives of the standards and initiatives of which they are part. At one end of this spectrum lie RLs for programs established by national governments. At the other end of the spectrum are baselines of discrete project-scale standards, be they designed for meeting mandatory emissions trading systems or for operating in voluntary carbon markets. At an intermediate scale are RLs that capture broader-scale activities beyond the project-level such as subnational or provincial RLs, and RLs for specific sectors or biomes.

National RLs provide benchmarks under the evolving UNFCCC REDD+ regime and Norway's partnerships with Brazil, Guyana, and Indonesia. An additional model for national-scale RLs is found in the emission targets and accounting benchmarks of the Kyoto Protocol, in particular the RLs for its developed country Parties' forest management activities.[7] In the voluntary carbon market, the "Jurisdictional and Nested REDD+ Requirements" of the Verified Carbon Standard (VCS-JNR) and the "Nested REDD+ Standard" of the American Carbon Registry (ACR Nested REDD+) provide guidance for the development of national or lower-level jurisdictional RLs.

5 For example, China's Panda Standard and Brasil Mata Viva standard.
6 For example, the results-based agreements of Germany's REDD Early Movers program, such as the contract between the Kreditanstalt für Wiederaufbau (KfW).
7 Article 3.4 of the Kyoto Protocol.

Figure 1: The Scale of REDD+[8]



Project-level RLs are found in the Clean Development Mechanism (CDM) and Joint Implementation (JI) mechanisms, national law-based standards, and all voluntary standards. These types of RLs are generally set within the project boundaries or a reference area. Project boundaries are defined by a project's geographical implementation area. In the case of REDD+, taking the ACR program rules addressing unplanned deforestation as an example, the project proponents "shall consider the cause of deforestation that the project will address, then consider the geographic range over which that activity is occurring. The goal is to determine potential leakage emissions from deforestation that have occurred across the entire area in which the project might have

8 Adapted from: Angelsen, A., Streck, C., Peskett, L., Brown, J., Luttrell, C. (2008). What is the right scale for REDD?, CIFOR InfoBrief.

an effect."[9] While similar considerations apply to other standards, the program documents of many of the smaller project-scale standards are less clear and fail to differentiate between project area, leakage belt, and the reference area for the RL or baseline.

Subnational RLs cover more area than a project, but less than an entire country. The VCS-JNR and the ACR Nested REDD+ standards apply not only to the national, but also to the subnational level. Both standards define the project rules within the broader context of jurisdictional RLs and provide for project-level RLs within the context of jurisdictional RLs. The VCS-JNR additionally provides rules for jurisdictional accounting. When it comes to defining an acceptable scale for jurisdictional REDD+, the VCS-JNR establishes that a "national jurisdictional proponent may determine the boundaries of subnational jurisdictions …" and that boundaries "may follow existing administrative (i.e., politically defined) boundaries, or may be based on ecosystems (i.e., ecoregions) or other designations."[10]

The Forest Carbon Partnership Facility (FCPF) also intends to finance results-based payments for subnational activities of "significant scale."[11] The FCPF defines 'significant scale' as the "national level, the level of an administrative jurisdiction within a country, or some other level, e.g., large watershed or Indigenous Peoples' territorial unit."[12] Similarly, the Governors' Climate and Forests Task Force (GCF) considers RLs for states and provinces.

2.2. Scope

Scope refers to the activities that fall under a RL. Most project-scale standards define methodologies that guide users on how to establish baselines for the various project and activity classes (e.g., forest management, afforestation, and avoided deforestation).[13] Defining the scope of a REDD+ RL is more complicated as REDD+ consists of various activities. These activities can be linked to categories established by the Intergovernmental Panel on Climate Change (IPCC) and their emissions can be separately measured:

- The first D of REDD+ refers to "avoided deforestation" and can be translated into the broad category of avoiding "conversion of forests to non-forests."
- The second D or REDD+ refers to "avoided degradation" and can be translated into the broad category of avoiding "emissions from forests remaining forests."
- The "plus" refers to improved forest management and forestation, which can be translated into the broad categories of "removals from forests remaining forests" and "conversion of non-forests to forests."

Requiring accounting for all categories under REDD+ adds significant complexity to REDD+ RLs compared to those RLs that only refer to a single activity or category. There is therefore a tendency among REDD+ standards to allow for a gradual extension of the RL from covering a single, to adding additional, activities or categories. Governments or other entities developing national and subnational RLs are thus provided with flexibility and

9 ACR Forest Carbon Project Standard, Version 2.1, Nov 2010, pp. 37-38. Available at: http://americancarbonregistry.org/carbon-accounting/forest-carbon-project-standard-v2.0/ACR%20Forest%20Carbon%20Project%20Standard%20v2.1.pdf.
10 VCS, Jurisdictional and Nested REDD+ (JNR) Requirements, Version 3, Requirements Document, October 2012.
11 See The Forest Carbon Partnership Facility, Participants Committee, Recommendations of the Working Group on the Methodological and Pricing Approach for the Carbon Fund of the FCPF (FMT Note 2012-8), 2012, p. 7. Available at: http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/June2012/FMT%20Note%202012-8%20Working%20Group%20Recomm%2006-09-12%20EN_0.pdf
12 Ibid.
13 See VCS, Agriculture, Forestry and Other Land Use (AFOLU) Requirements, v.3, Requirements Document, 4 October 2012.

potential cost savings in carbon accounting. They are afforded the option to start accounting for avoided deforestation, and then add additional activities (or categories) over time as capacities, systems and consequently the available data improve. However, the eventual goal of most REDD+ initiatives remains an eventual comprehensive forest accounting system.

Where a standard allows the accounting for a variety of activities under a single RL, it is vital that there is no double counting of emissions across the different activities. The individual activities have to be explicit and non-overlapping. For example, if avoided degradation from fuel wood collection (e.g., through the adoption of fuel-efficient cookstoves) and avoided degradation from grazing in a forest (e.g., through adoption of rotational grazing or stall feeding) both are selected as activities, it has to be ensured that emissions reductions are not double counted in both activities.

Project-scale standards that define rules and guidance for the setting of baselines for various activities include the VCS, ACR and Climate Action Reserve (CAR). All three standards cover a wide range of land-use activities, some of which by accepting agriculture, grassland and wetland (including peatland) projects even go beyond the currently defined range of REDD+. The manner in which activities are actually grouped and the terminology used may, however, differ among standards. For instance, whereas ACR and CAR add afforestation, reforestation, and improved forest management to 'REDD+ activities', the VCS provides separate RL guidance for Afforestation, Reforestation and Revegetation, Agricultural Land Management, Improved Forest Management, Reduced Emissions from Deforestation and Degradation, Avoided Conversion of Grasslands and Shrublands and Wetlands Restoration and Conservation. Other standards limit the eligible activities to a small subset of forest activities. Such restricted standards include:

- The project-scale compliance standards of CDM and JI;
- The project-scale voluntary standards of CarbonFix,[14] Plan Vivo, and Brasil Mata Viva; and
- The domestic law-based offsets standards (NZ-PFSI, California AB-32 and US Northeast RGGI).[15]

2.3. Methodology

The RL scenario for a jurisdiction, program, or project activity is determined for each designated geographic area, in accordance with a system of technical procedures - a methodology - specified by the relevant standard. The RL methodology chosen entails how emissions and removals will be calculated and what carbon pools, data, models and assumptions will be used. The resulting RL often consists of a combination of emissions levels, rates of change, and geospatial maps.

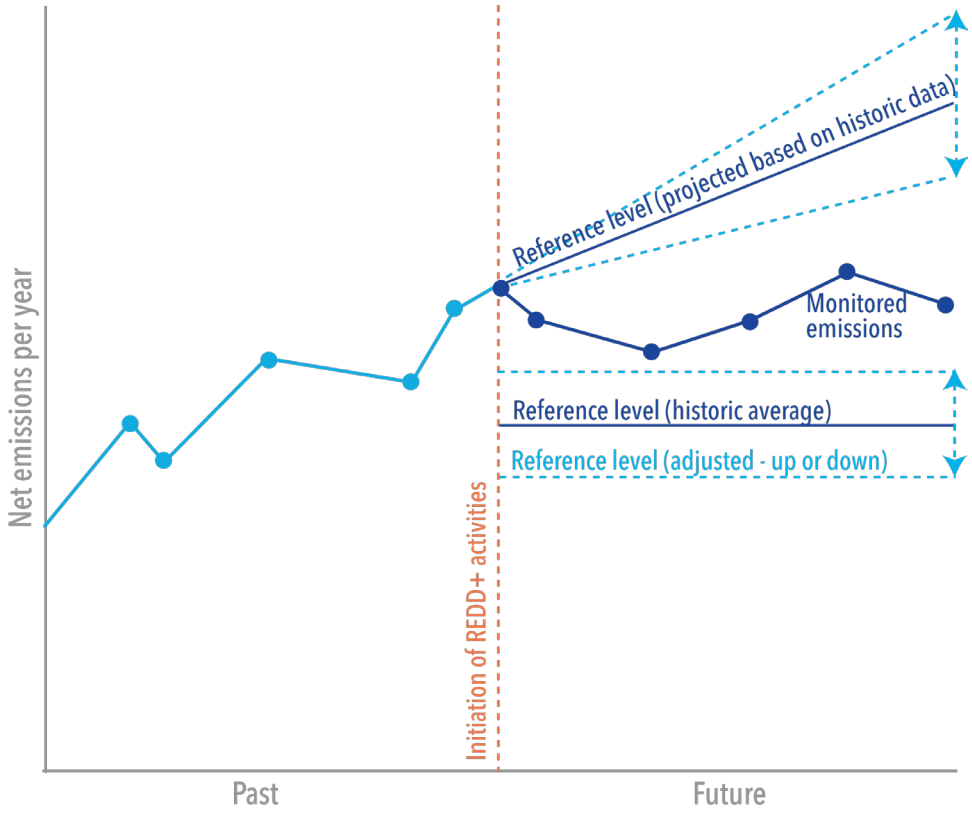
Historic vs. projected Reference Levels

There is an explicit distinction between a "business-as-usual" RL, which is a forecast of projected rate, location and/or changes in carbon stocks and GHG emissions for a given time period and a "historic" RL defined as the historic level of the rate, location, and changes in carbon stocks and GHG emissions over some time period in the past. Projected rates can be accomplished through complex modeling when robust data is available. Where

14 Note that at the time of writing CarbonFix is undergoing a transition in management to the Gold Standard, with most of the characteristics of the current CarbonFix Standard to merge into the new Gold Standard scope "New Forests & Agroforestry" expected to be complete sometime in mid-2013. Correspondence by email from The Gold Standard, Jan 2013.
15 Note that although the NZ-PFSI and RGGI standards are project-based, the California cap and trade program also accepts sectoral credits.

such data is not available, many view the best predictor of future emissions to be an estimate of emissions in the recent past based on an analysis of historical rates of deforestation and forest degradation. The RL may then be set either by creating a linear projection into the future or using an historic average (see Figure 2). Additional adjustments may then be applied to reflect other trends (expected policies/measures) or future events (underlying drivers, such as population growth).

Figure 2: Historic (projected and average) Reference Levels and adjusted Reference Levels



Which and how adjustments may be applied depends on the initiative and standard rules. Such adjustments can consist of pre-set factors (e.g., forest coverage, population density) or be based on modeling (e.g., in the case of the VCS). RLs can also be negotiated between two parties, where historic data and the forward-looking factors will be part of the bilateral negotiation (e.g., Guyana and Norway).

Standards may be grouped according to whether they rely purely on historic data or whether they allow additional modeling and adjustments. Generally, domestic law-based and voluntary standards in developed countries tend to rely largely on historic data, whereas developing countries, at least those with low historic and current emissions, argue in favor of the consideration of future trends and resulting adjustments of baseline emissions. An example of a standard relying purely on historic emissions is the New Zealand Permanent Forest Sink Initiative (PFSI), which requires annual accounting and uses the previous year's emissions and removals as reference point. The Japanese J-VER voluntary system applies a similar point-based approach, referring to a

reference year rather than requiring the establishment of a RL. Another example is the baseline agreed by Norway and Brazil, which is based on a 10-year rolling average of historic data.

Most other standards and initiatives allow adjustments to the projection of historic emissions. The standards for REDD+ under the UNFCCC and for forest management RLs under the Kyoto Protocol (2nd commitment period) are based on historical emissions, but can be adjusted to national conditions. Forest management reference levels for Annex I countries allow for wide circumstantial adjustments, as countries each proposed differing RLs based on national circumstances, and common methodologies among countries represent the minority rather than the majority.[16,17] In the case of REDD+ developing countries "…in establishing forest reference emission levels and forest reference levels [they] should do so transparently taking into account historic data, and adjust for national circumstances."[18] REDD+ negotiations are too preliminary at the time of writing to know if and how Parties will allow adjustments based on national circumstances, but this is likely given the emphasis many countries put on the need for national adjustments.

The VCS outlines in its JNR rules that a historical level of emissions should be calculated for each selected activity. Based on the historical scenarios for each activity, the VCS-JNR may include modeled adjustments to reflect national or subnational circumstances. For example, deforestation projections may be based on changes in variables that influence deforestation such as GDP, access to forests, commodity prices, population growth or other variables for which credible projections are available. Such adjustments shall be justified, for example, by demonstrating that there is greater certainty in projection of the correlated independent variable than in direct projection of deforestation and/or that the trends in the independent variable precede trends in deforestation.[19] The ACR Nested REDD+ Standard requires historical emissions calculations in developing baselines for unplanned and planned deforestation and improved forest management, but requires modeling of forest growth rates for A/R baselines.[20] The CAR Forest Project Protocol requires 100 year modeling of carbon stock changes for each project's required and selected onsite carbon pools, based on carbon stocks inventoried at the initiation of the project.[21] Modeling includes assumptions on forest growth and harvesting, as influenced by legal and financial constraints, and assumptions on the extent of harvesting operations under a BAU (business-as-usual) scenario.

RLs developed by programs seeking to have their credits accepted into the California cap-and-trade program need to reflect "emissions that have occurred during the normal course of business or activities during a designated period of time within the boundaries of a defined sector and a defined jurisdiction."[22] California differentiates RLs from crediting baselines by explaining that the latter "refers to the reduction of absolute GHG emissions below the business-as-usual scenario or reference level across a jurisdiction's entire sector in a sector-

16 See UNFCCC Document FCCC/KP/AWG/2011/INF.2, Note by the Secretariat, Synthesis report of the technical assessments of the forest management reference level submissions, p. 6. Available at: http://unfccc.int/resource/docs/2011/awg16/eng/inf02.pdf, (listing eight Party-proposed RL methodology variations based on national circumstances, with the largest common approach that developed by the Joint Research Centre -JRC- of the European Commission -14 EU member States).
17 Many Annex I Parties also presented values regarding GHG emissions reductions from harvested wood products (HWP), which mostly consisted of 1990 data but some included information as far back as 1900.
18 See UNFCCC Document FCCC/CP/2009/11/Add.1, Dec 2009, Decision 4/CP.15, p. 12. Available at: http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf
19 See VCS JNR Requirements, v. 3.0, p. 26.
20 See American Carbon Registry, Nested REDD+ Standard (hereafter "ACR Nested REDD+ Standard"), v.1.0, Oct 2012, pp. 17-18. Available at: http://americancarbonregistry.org/carbon-accounting/acr-nested-redd-standard-v1.0.
21 See Climate Action Reserve, Forest Project Protocol, v. 3.3, Nov 2012 (hereafter "CAR Forest Project Protocol"), p. 41. Available at: http://www.climateactionreserve.org/how/protocols/forest/dev/version-3-3/.
22 See definition of "reference level" under the California Cap-and-Trade Law, supra note 4, p. A-170.

based crediting program after the imposition of greenhouse gas emission reduction requirements or incentives."[23]

With a view on the emerging California system, the GCF has suggested to its members the construction of both a reference level baseline and a crediting baseline. The RL would be established using average historical annual deforestation rates on spatially explicit activity data from remote sensing for 5-10 years from a specified period, with a possibility of adjusting this rate every 5 or 10 years. Crediting baselines, in turn, could be defined as a downward trajectory "with step-wise reductions and a target of 50 percent reductions in gross deforestation from the reference level baseline by 2020, with an additional requirement to maintain xx% of stocks, where crediting is only possible if emissions are below the crediting baseline in each crediting period."[24] See Table 1 for a comparison of the advantages and disadvantages of the various methods to build RLs.

The lack of reliable data or the desire to establish political incentives often requires additional modification. In their agreement Norway and Guyana have set the emissions baseline using a combination of the 2000-2009 Guyana historical deforestation baseline for (0.03%) and the 2005-2010 average global deforestation baseline (0.52%).[25]

Table 1: Comparative advantages and disadvantages of various methods to establish RLs

Methods to set RLs	Implications for Jurisdictional RLs	Implications for Project-level RLs	Examples
Historical RL (specified time period or average)	(+) Transparent and simple (+) Conservative, at least at the global, aggregated level (+) Historical data on land cover change widely available and used (emission factor data is more difficult) (+) Broad global consensus on methodology (-) No incentives for HFLD countries (-) Does not adapt to changes in drivers of deforestation and future trends	(+) Transparent and simple (+) Cost efficient (-) Does not adapt to changes in drivers of deforestation and future trends	Jurisdictional level: Brazilian Amazon Fund Project level: New Zealand PFSI, Japanese J-VER

23 See definition of "Crediting Baseline" under California Cap-and-Trade Law, supra note 4, section 95802 "Definitions," line 65.
24 See GCF, Design Recommendations for Subnational REDD Frameworks (discussion draft), Aug 2011 (hereafter "GCF Design Recommendations"). Available at: http://www.gcftaskforce.org/documents/REVISED_DRAFT_Task%201_Subnational_REDD_Frameworks_Report.pdf
25 Norway Ministry of the Environment, "Latest developments of the Guyana-Norway REDD+ Partnership," Mar 2011, pp. 1-2. Available at: http://www.regjeringen.no/upload/MD/2011/vedlegg/klima/klima_skogprosjektet/Guyana/GuyanaNorwayQandA_310311.pdf

BAU Projected modelled RL (statistical analysis based on historical data, trends and other relevant factors)	(+) Flexible construction. Accounts for jurisdictional drivers and trends (+) Potentially a more realistic projection into the future (-) Possibility to inflate RLs which leads to limited transparency, credibility and environmental integrity (-) Diverse methodologies, no accepted formula. Need for harmonized set of assumptions and international control of input data to ensure comparability (-) More robust data and statistical analysis/ modelling needed	(+) Opportunity to reflect future threats provided they are substantiated and sufficiently real (-) Costly, requires a case-by-case verification (-) Limited transparency	Jurisdictional level: Rules for ACR Nested REDD+, VCS-JNR allowed under Kyoto Protocol for forest management Project level: VCS, ACR, CAR
Historical RL adjusted upward or downward (based on justified evidence that historical RL alone would not be the most accurate benchmarck)	(+) Simple, yet flexible enough to account for unique jurisdictional circumstances (+) Potentially a more accurate baseline if adjustments are based on rigorously-justified, scientifically-based factors (+) Global additionality can be ensured (through appropriate set of adjustments) (-) Agreement on appropriate adjustments may be highly political and lack transparency (-) Diverse methodologies for appraisal and politics could compromise equity	(+) Easier and cheaper to construct and verify compared to BAU projections using more complex data and models (+) Can be used to achieve politically desired incentives at the national level (distributional effects) (-) Justified evidence needed	Jurisdictional level: Agreement between Norway and Guyana

The various initiatives and standards analyzed by this paper differ in the way the RL is constructed. In some cases, such as with the New Zealand PFSI and the J-VER, the past reported emissions and removals simply serve as reference points. In the cases where standards produce credits outside of a regulated system (voluntary carbon market standards) or where RLs are set by those participating in a particular REDD+ initiative (FCPF, bilateral REDD+ agreements), the RL is constructed for each project, program, or investment. Within those individually constructed RLs, one can further differentiate between those set according to particular program rules and those negotiated bilaterally. The former is the standard method for carbon standards, the latter for REDD+ results-based finance initiatives (e.g., the FCPF).

Although the method on how to construct a RL differs from standard to standard, certain steps are common to most of them. Table 2 below taken from Meridian 2011, Guidelines for REDD+ Reference Levels, lists some of these common steps with examples that explain how to fulfill them.

Table 2: Generally applicable steps for the preparation of REDD+ RLs

Step	Examples	References
1. Define the pools and gases (aboveground biomass, belowground biomass, litter, dead wood, and soil organic carbon) included in the RL with a justification for their inclusion and exclusion	Above-ground , below-ground, and dead wood, since other pools are insignificant; includes CO_2 only, as non-CO_2 gases are *de minimus*	IPCC 2006 Guidelines[26]
2. Specify the definition of forest used	All lands with tree canopy cover of 20% or more, with minimum area of 1 ha, and trees taller than 3 m	According to thresholds for defining forest in the Marrakesh Accords[27]
3. Establish the historic time period within which emissions and removals will be estimated	2000 to 2010	- -
4. Describe the methods used to estimate carbon stocks for the selected time period	Because no data exist in country, a plan was designed and implemented to collect data from a sufficient number of plots in the forest class where deforestation had occurred during the selected time period to achieve uncertainty around the mean of +/-15% with 95% confidence	Global Observation of Forest and Land Cover Dynamics (GOFC)-GOLD Sourcebook 2010[28]

26 IPCC, Guidelines for National Greenhouse Gas Inventories, 2006 (hereafter "IPCC 2006 Guidelines"). Available at: http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html
27 See UNFCCC, Decision 2/CP.7. Available at: http://unfccc.int/resource/docs/cop7/13a01.pdf#page=54.
28 See GOFC-GOLD, A sourcebook of methods and procedures for monitoring and reporting anthropogenic greenhouse gas emissions and removals caused by deforestation, gains and losses of carbon stocks in forests remaining forests, and forestation. GOFC-GOLD Report version COP16-1, 2010.

5. Estimate the area of forest annually converted to different land uses	X million hectares cleared for small-scale grazing lands, Y million hectares for industrial-scale annual crops, and Z million for conversion to small-scale oil palm plantations	GOFC-GOLD Sourcebook 2010
6. Document past trends in forest conversion	Annual conversion of forest to non-forest land decreased/increased by XX over the past 10 years	- -
7. Estimate the area of forest degradation by each driver (e.g., logging, charcoal production)	Y million hectares of selective logging concessions, Z million hectares of forest subject to fuel wood/charcoal production; X thousand hectares illegally logged	GOFC-GOLD Sourcebook 2010
8. Describe the methods used to estimate emission factors for forest degradation	Because no data exist in country, a plan was designed and implemented to collect data on carbon losses from logging and fuel collection	GOFC-GOLD Sourcebook

Source: Meridian 2011, Guidelines for REDD+ Reference Levels.

Data considerations

The quality of a RL depends, among others, on scientifically credible estimates of their historic emissions and removals based on data collected according to commonly accepted standards. To ensure credibility, standards often require that data used in constructing RLs are collected and analyzed by the jurisdictions or project proponents, or taken from trustworthy and publicly available sources, such as national/regional forest inventory data.

Data needed include both remote sensing/geospatial products and non-spatial information (e.g., tree measurements, harvesting rates). Depending on the nature of the activity and carbon pool being assessed, emission factors may be based on measurements of the carbon stocks in different types of vegetation cover (e.g., forest, cropland, pasture) or on measurements of forest disturbance and associated emissions (e.g., quantity of logging). [29] See Table 3 for a list of required data.

In addition to data, credible data analysis techniques to develop emissions estimates are fundamental to meeting accepted standards. These techniques often involve converting data (e.g., tree diameter) into allometric equations or models to derive biomass or carbon stock estimates, and subsequently carbon flux estimates using different periods.

29 See Winrock International and World Bank, Decision Support Tool for Developing Reference Levels for REDD+, 2012. Available at: http://www.leafasia.org/tools/decision-support-tool-developing-reference-levels-redd

Guidelines on collecting data and estimating carbon stock/emissions are provided in varying detail by all standards, including voluntary and compliance project-scale mechanisms and international multilateral or bilateral initiatives. For example, The IPCC provides two guidelines to aid in carbon emission calculations for GHG inventories in the agriculture, forests, and other land use (AFOLU) sector: IPCC 2003 Good Practice Guidelines for LULUCF[30] and the IPCC 2006 Guidelines for National GHG Inventories).[31] These guidelines are basic and outline a step-wise (Tier 1-3) approach for data collection, where Tier 1 uses best available data from global data sets, Tier 2 uses national, field-generated data, and Tier 3 uses finer scale, ground-truthed and surveyed data. While Tier 1 data would be inappropriate for regional and project-level RLs, it may be used as an interim source for national RLs in countries with very little data and capacity. Most existing data for developing countries are of poor quality and limited value.[32] It is therefore important to note that most developing countries will need to collect new data to establish credible estimates of historic emissions and removals. The established systems should be the same that monitor future performance, e.g., same pools selected, so that emissions and removals that are monitored over time can be compared directly to the emissions and removals in the reference scenario.

Project-scale mechanisms follow a more rigorous set of standards for types of data, data collection and emissions calculations. CAR has issued a 'Quantification Guidance' that formulates data requirements on how to estimate carbon stocks and fluxes. Within its Quantification Guidance, CAR establishes that all "inventory methodologies must be based on randomized or systematic sampling and include the minimum quality parameters described in this section for each carbon pool." It goes on by listing the requirements for levying data from sample plots and clarifies that "inventory methodologies must include a description of how the sampled data will be archived and the analytical tools that will be included in the analysis of carbon stocks."[33] ACR formulates specific requirements for data quality when it states that the "Project Proponent should reduce, as far as is practical, uncertainties related to the quantification of GHG emission reductions or removal enhancements."[34] It specifies further that "the ACR's general requirement is a 90/10 rule that the statistical confidence interval of sampling be no more than 10% of the mean estimated amount of emission reduction/removal."[35] The VCS defines data requirements in their baseline rules. In addition, specific guidance and additional data requirements are defined for each project type separately. Where a solid data base is available, as in New Zealand, the system can rely on default carbon stock tables that are based on "well-established growth modeling techniques to predict the growth of trees of a particular forest type, and hence the increase in carbon stocks with age."[36] The New Zealand default tables are formulated for five forest types.

30 IPCC, Good Practice Guidance for Land Use, Land-Use Change and Forestry, 2003. Available at: http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html.
31 IPCC 2006 Guidelines, supra note 26.
32 See Meridian Institute, Modalities for REDD+ Reference Levels, Technical and Procedural Issues, 2011.
33 Climate Action Reserve, Quantification Guidance for Use with Forest Carbon Projects, Nov 2012. Available at: http://www.climateactionreserve.org/wp-content/uploads/2012/08/FPP_Quantification_Guidance.pdf
34 American Carbon Registry, Forest Carbon Project Standard, Version 2.1, Nov 2010. Available at: http://americancarbonregistry.org/carbon-accounting/ACR%20Forest%20Carbon%20Project%20Standard%20v2.1.pdf
35 American Carbon Registry, Requirements for Registration of REDD+ Projects Nested within a Jurisdictional Accounting Framework, Version 1.0, Nov 2010, p.20. Available at: http://americancarbonregistry.org/carbon-accounting/acr-nested-redd-standard-public-comment-version
36 The Reforest Trust, Information memorandum forward sale of NZ emissions units, Apr 2011. Available at: http://www.reforest.org.nz/pdf/RFT%20Information%20Memorandum%20April%20%2711.pdf

Table 3: Data required, needs addressed, and associated issues for developing BAU baselines

Data required	Need addressed	Issues
Definition of forest[37]	Determines which lands would be included in REDD+ activities	Definition of forests with low thresholds for forest cover, height and minimum area ensure that practically all lands that contain trees could be eligible for REDD+ incentives; Defining forests in a way that encompass more lands in the historic period can cost more in future monitoring.
Carbon stocks of forests and non-forests and carbon gains (forest growth) and losses (e.g., extraction of trees for timber and fuel) that represent the historic time period	Estimates the emission factors for each relevant REDD+ activity	Few countries have robust estimates, with low uncertainty, of carbon stocks in forests at scale (e.g., forest volume inventories not national nor include all tree species and data from research plots do not permit extrapolation to larger scales). Data on extraction of trees for timber or fuel not well tracked and have large inconsistencies; forest growth after tree removal very poorly known
Category analysis of carbon pools	Determines which of the five IPCC pools to include[38]	There is a broad range in the magnitude, variability, and significance (relative to the total stock) of the five forest carbon pools resulting in different measuring and monitoring costs.
Time period for estimating historic emissions	Establishes an appropriate time average to account for varying emission and removal	A longer time frame may be needed where special circumstances apply, such as where there have been conflicts more than 5 years ago followed by periods of increased economic activity, or the opposite where conflicts have been more recent and economic activity has not returned.
Interpreted remotely sensed data products for forest cover/forest use (FC/FU) for the historic time period	Estimates the historic rate and location of FC/FU change	1) Deforestation can be confidently measured with existing satellites since 2000 and even better with the launch of newer sensors that can penetrate clouds; 2) Obtaining rates of forest degradation or enhancement of carbon stocks in existing forests is more challenging as many changes cannot be detected in commonly available imagery;[39]) Historic national areas of A/R generally are well tracked by countries.

37 Many developing countries defined their forest according to the Marrakesh Accords with the idea of engaging in afforestation and reforestation activities under the CDM.
38 Aboveground biomass, belowground biomass, litter, dead wood, and soil organic carbon.
39 While not all activities causing degradation require remote sensing data, being able to use such data would give more confidence to estimated emissions. For example, area of forests undergoing selective logging (both legal and illegal) with the presence of gaps, roads, and log decks are likely to be observable in remote sensing imagery. Emissions from selective logging can also be estimated without the use of satellite imagery, i.e., based on methods given in the IPCC GL-AFOLU for estimating changes in carbon stocks of "forest land remaining forest land." Thus historic emissions from degradation by large scale logging and for forest management could be estimated. Historic removals, either due to regrowth in degraded forests or from direct enhancements (e.g., interplanting), and historic emissions from degradation due to forest fires, overexploitation for fuel wood, and over grazing by animals, may also be difficult to estimate without considerable effort (GOFC-GOLD Sourcebook, 2010).

Main agents or drivers of forest cover change	Estimates how agents/drivers of land cover change impact the change in carbon stocks	Agro-industry tends to clear large land areas, reduce the carbon stocks in vegetation near zero, and significantly impact soil carbon stocks; Small scale farmers tend to clear many small patches of land, often burn the vegetation and leave remnants behind, and have less impact on soil carbon.
Spatial data on biogeographical factors (e.g., elevation and slope, soil suitability, agroecological zones, natural disturbances, transportation networks, towns)	Estimates the historic rate and location of FC/FU change	Many suitable data bases for task not available for all countries or at the appropriate scales

Source: Meridian, 2011, Modalities for REDD+ Reference Levels, Technical and Procedural Issues

Additionality

Additionality defines the supplementarity of an emission reduction effort, in particular, where such effort takes place outside of the countries and sectors that fall under a defined emissions cap. Additionality is closely linked to the establishment of RLs. Similarly to a BAU RL, the counterfactual nature of the concept makes it impossible to ever prove additionality. The testing of additionality generally involves the establishment of a RL against which reality is gauged. Project-based standards often require an additional case-specific proof of whether a mitigation project would have happened in the absence of a mitigation incentive (in which case it would not be additional) or not (in which case it would be additional). A particular tool that helps project developers to provide evidence about the additionality of a mitigation effort has been developed under the CDM and is used in a similar form in various voluntary carbon standards. At the same time, many regulated standards prefer to test the additionality of a project based on easy to verify criteria, for example that the project was not required legally.

Most voluntary and national law-based offset standards require project-specific additionality to be proven, either using the CDM or other additionality tools or requiring dedicated explanations in the project documentation. For instance, ACR, CarbonFix, Plan Vivo and Panda Standard all include project specific additionality testing, based on providing evidence that the project is neither mandated by law or regulation nor common practice in a particular country or context. A barrier analysis test would require proof that carbon finance has helped the project to overcome financial, technological or institutional barriers to the project, thereby demonstrating additionality.

Similarly, domestic law-based project standards such as the Australian Carbon Farming Initiative (CFI) and subnational initiatives such as California AB-32 and Northeastern US RGGI all require additionality tests. However, the test is limited to the proof of additionality as a regulatory surplus (i.e., the project is not already required by law) and supplemental to common practice (i.e., that the project goes beyond business as usual practice).

Jurisdictional standards or programs often seek to internalize additionality through a conservative national RL that automatically assumes any emissions reductions relative to this conservative benchmark to be additional. The concept of additionality would then mean that every credited emission reduction for REDD+ should be additional (i.e., to ensure that no BAU emissions are rewarded). In other words, additionality would be captured by the requirement that a crediting level is set at or below the BAU RL. When nesting is used, the additionality of singular activities implemented in the context of a broader jurisdictional or national program is less of a concern provided that the sum of the various activities, policies and programs lead to a reduction of GHG emissions against a credible national or jurisdictional RL. Examples include national programmatic law standards such as the NZ-PFSI (where all sequestration from post-1989 forests is automatically deemed additional) or bilateral standards such as Norway partnerships with Guyana and Indonesia, in which each of the RLs have been deemed to capture additionality.

3. Principles and Procedures

3.1. Principles

Some common fundamental principles regarding the creation and submission of RLs can be found in the majority of the standards and initiatives assessed in this report. These are: transparency, consistency, completeness, accuracy, and comparability. These principles largely stem from the IPCC 2003 Good Practice Guidance for Land Use, Land Use Change and Forestry and the 2006 IPCC Guidelines for National GHG Inventories.[40] Most of these principles are clearly spelled out in the guidance and protocols for each of the relevant standards. For regulated and mandatory standards, these principles and criteria are normally specified in the general legislation establishing the scheme and in secondary legislation.[41]

Figure 3: RL Principles and Criteria across Standards

Core Principles Relevant for all standards
Transparency
Consistency
Completeness
Accuracy

Specific Criteria Focus vary per standard	Relevant Standards
Enforceability	New Zealand PFSI, California Compliance Offset Protocol for US Forest Projects, state regulations transposing the RGGI model rule
Third-party verification	CDM, JI (Track 2), Kyoto Protocol forest management RL, VCS, CAR, ACR, Plan Vivo, Brasil Mata Viva, FCPF*
Tier two quality data	New Zealand PFSI, J-VER
Tier three quality data	VCS, ACR, CAR, CarbonFix
Priority on Social and Economic Benefits	Plan Vivo, Mata Viva
Localized	Panda Standard

* These standards have not reached a final decision on RL criteria at the time of writing, but preliminary discussions suggest this track.

For jurisdictional standards, the focus is normally on process rather than on the particular final results. Principles like transparency and comparability are particularly prominent. For instance, GCF unofficial recommendations suggest that projected deforestation rates be defined with very transparent criteria and indicators (e.g., number of license applications, demand for land, spatial planning, and/or GDP).[42] Acceptance of sector-based credits

40 IPCC, Guidelines for National Greenhouse Gas Inventories, Volume 4: Agriculture, Forestry and Other Land Use, 2006.
41 Subarticle 13 of California cap-and-trade regulations defines the main principles and criteria for offsets.
42 GCF Design Recommendations, supra note 24, p. 16.

under the California cap-and-trade program is also based on the requirement of transparency.[43]

Transparency is also an important criterion in the scope of expert review teams for proposed forest management RLs under the Kyoto Protocol. Although expert review teams are barred from making judgments on countries' policy choices, they are requested to make technical recommendations, given to the relevant country and subsequently made publicly available by the UNFCCC secretariat.[44] Comparability, in turn, was initially assured by requiring countries to utilize a table with common formatting and content, providing guidance to countries and ensuring consistency in their submissions. The table included, among other issues, specific headings for countries' proposed reference levels and reference intervals (expressed in absolute numbers), forecasts for the first commitment period and for the period 2013-2020, and brief explanations on how the relevant data were established, including assumptions related to the treatment of natural disturbances and harvested wood products.[45]

Finally, depending on the objective and purpose of the relevant standard, some procedural principles may gain greater emphasis. For instance, Plan Vivo focuses on the demonstration of full stakeholder engagement and participation during project design and implementation. Equitable benefit sharing with a transparent mechanism to receive, hold, and disburse payments is also a vital criterion of Plan Vivo. Geographically restricted standards like the Panda Standard, on the other hand, may have overarching principles that are location-specific and can impact RL design features. For example, an adjustment in scope of activities under the Panda Standard is guided by the need to "first concentrate efforts on real domestic needs."[46]

3.2. Procedures

Procedural aspects relate to the formal steps required for submitting, approving, and periodically reviewing RLs, as well as the procedural principles underpinning this process. Procedural matters include questions such as which entity creates and submits RLs, which type of body is responsible for assessing and approving RLs, and whether criteria for submitting RLs should be prescriptive or allow for some flexibility to RL proponents. The standards and initiatives studied here can be grouped largely under three categories with respect to the way they deal with RL procedural aspects:

- Bottom-up submission of RLs with a centralized technical approval process, often adopted by project-scale standards (such as the CDM, the VCS, ACR, CAR, Plan Vivo, Carbon Fix, and the Australian CFI);
- Bottom up submission of RLs with a political and/or negotiated endorsement process, usually seen in the submission of jurisdictional RLs (e.g., the Kyoto Protocol and, to some extent the VCS JNR); and
- Top-down definition of methodologies and RLs normally found in some domestic law-based standards (for instance, the New Zealand PFSI, the J-VER, and California Compliance Offset Protocol for US Forest Projects).

43 See California Cap-and-Trade Law, supra note 4, Section 95994, (a)(4). ("The program includes a transparent system for determining and reporting when it meets or exceeds its crediting baseline(s), and evaluating the performance of the program's sector during each program's crediting period relative to the business as usual or other emissions reference level..")
44 See Appendix II, UNFCCC Decision 2/CMP.6.
45 See initial table with common format and content used by country Parties to the Kyoto Protocol. Available at: http://unfccc.int/files/kyoto_protocol/application/pdf/awgkplulucftable131109.pdf
46 See Panda Standard Project Design (Section III), in the Panda Standard V1.0, 2009. Available at: http://www.pandastandard.org/downloads/PandaStandard_v1ENGLISH.pdf

Some of the standards like the ones resulting from bilateral negotiations and the FCPF, however, will not fit neatly in any of these models. This section attempts to provide comparison of the main procedural aspects associated with RLs in accordance with the above categories of standards.

Figure 4: General Classification of RL Procedures

Top-down	Bottom-up centralized	Bottom-up negotiated
Mandatory with little flexibility	Level of flexibility varies	Flexible
Very prescriptive. Established by law and regulations. Process can be more efficient.	Process can be lengthy and detailed due to project-based character and pure offsetting nature	Process potentially lengthy due to negotiated process
Domestic law-based	Purely technical	Mixed political and technical considerations
Standards in this category	**Standards in this category**	**Standards in this category**
California Compliance Offset Protocol for US Forest Projects	CDM	Kyoto Protocol forest management RL
New Zealand PFSI	JI	Norway bilateral standards
J-VER	VCS	VCS JNR
	Plan Vivo	FCPF*
	ACR	REDD+**
	Australian CFI	GCF*
	CAR	
	CarbonFix	
	Panda Standard	

* These standards have not reached a final decision on RL criteria at the time of writing, but preliminary discussions suggest this track.

** Based on negotiation history and as currently reflected in the UNFCCC text (CP.17, SBSTA 35), REDD+ RLs are meant to only be negotiated/adjusted in case-specific circumstances (i.e., in the case of high forest cover, low deforestation countries) in order to avoid loopholes seen as problematic in LULUCF. However, final decisions on RL criteria have yet to be reached.

Process of submission and approval

The large majority of project-scale standards assessed in this paper present an analogous process of submission and approval of RLs. This involves a bottom-up submission of baseline methodologies with a centralized technical approval process. Under these standards, project and program developers, as well as other authorized

entities, propose baseline methodologies which are reviewed by a technical body, undergo a period of public consultation, and are eventually approved by a regulator or administrator of the standard.

Under this category of standards, bodies performing technical assessments can either be external or internal to the relevant standard (or even both). The VCS, for instance, requires a double technical assessment by two different external entities, known as validation/verification bodies. The Australian CFI provides for a sole internal technical committee, the Domestic Integrity Offsets Committee, comprised of independent experts and a government representative. The CDM, in turn, makes use of both an external technical assessment body known as 'designated operational entity,' and an internal assessment body comprised of independent experts (the Methodology Panel). Whereas the first is responsible for checking the completeness of information submitted, the second undertakes a more detailed assessment of the baseline methodology and makes recommendations regarding approval by the regulator or necessary modifications to the proposed methodology.

Final approval normally rests with the main regulator or administrator of each standard, for instance, the Executive Board under the CDM, VCS Association under the VCS, and the Minister for Climate Change and Energy Efficiency under the Australian CFI. For Plan Vivo, this responsibility falls under the Technical Advisory Group of the Plan Vivo Foundation.[47]

Standards under this category tend to have rather prescriptive criteria for approving baseline methodologies. Such criteria are normally set-out in detailed guidelines, protocols, or in the relevant legislation enacted and/or made public by the standard and become fixed in the baseline methodology once this is approved. The process for developing and approving methodologies is often lengthy and complex, although some efforts are being made to streamline approval cycles and reduce transaction costs.[48]

The second model, 'bottom-up submission with a negotiated and/or political endorsement process,'' is often adopted by standards and initiatives promoting jurisdictional RLs. Under this model, national and/or subnational jurisdictions put forward RLs, following minimum common criteria established by the relevant standard or initiative. The proposed RLs are then negotiated and endorsed either multilaterally (in case of the Kyoto Protocol) or bilaterally (e.g., VCS-JNR, and ACR Nested REDD+). Some standards will also provide for a technical review preceding any political agreement on or final negotiation of the RL.[49]

This is the case, for instance, with the submission and approval of forest management RLs for the Kyoto Protocol's second commitment period. There, each Party to the Protocol initially shares (on a voluntary and informal basis) country-specific information and data regarding RLs, including tentative RL numbers, in order to assist other parties with gaining better understanding over assumptions and uncertainties in relation to the

47 See The Plan Vivo Manual: Guidance for Developing Projects, 2006. Available at: http://planvivo.org.34spreview.com/wp-content/uploads/Guidance-manual_Plan-Vivo.pdf.
48 Examples include the possibility of developing standardized baselines under the CDM and the pro-active interaction seen between the Department of Climate Change and Energy Efficiency and the Department of Agriculture, Fisheries and Forestry with industry associations to develop methodologies and the use of positive lists (i.e., list of activities whose additionality is pre-set and dispense with demonstration) under the Australian CFI.
49 For example, the FCPF asks for a "Ex Ante Assessment" consisting in the assessment by an Independent Third Party of an Emission Reductions Program, including its Reference Scenario, before it implementation, See International Bank for Reconstruction and Development, Charter Establishing The Forest Carbon Partnership Facility, May 2011. Available at: http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/May2011/FCPF%20Charter%20-%20CF%2005-11-2011%20clean.pdf.

forest management accounting in each country.[50] Based on information and insights exchanged, the parties then negotiate the minimum criteria for constructing reference levels and propose their respective RLs.[51] RLs submitted are also subject to assessments by expert review teams, which identify inconsistencies and provide recommendations.[52]

The ACR Nested REDD+ standard also allows countries proposing REDD+ programs to develop their own reference levels, although it does require minimum criteria to be met.[53] In addition, although the ACR Nested REDD+ guidance requires that the jurisdictional RL be reviewed by an approved independent validation body, it also may accept alternative (and non-independent) validation mechanisms and processes put in place by the jurisdiction.[54]

The California Compliance Offset Protocols follows a more top-down approach for defining RLs. The Protocol clearly defines all steps necessary to assess net GHG reductions and removal enhancements, outlining mandatory requirements for modeling carbon stocks (including, for instance, an exhaustive list of approved growth models that can be used by project proponents, detailed allometric equations for measuring carbon, and the modeling elements necessary for forecasting or updating baselines.[55]

Process of Review

The standards following the 'bottom-up submission of RLs with centralized technical approval process', like the CDM, the VCS, the ACR, the Australian CFI, and Plan Vivo tend to provide for a limited period of validity of baseline methodologies, using a pre-defined process and criteria for periodic review of baselines. The validity of the baseline is normally attached to the validity of the crediting period of the relevant activity, or the period in which that activity is able to receive credits for actual emission reductions or removals achieved. Once the crediting period expires, the original baseline needs to undergo the centralized approval (or-revalidation) process once again. The period of validity of RLs or baselines of in these types of standards can either be fixed at the outset, or decided on a case-by-case basis in accordance with a pre-set range of years.[56]

The criteria for review and renewal of baselines are defined in the standards. These normally refer to a complete re-assessment of the baseline and the additionality aspects, including of the impacts of new national and sectoral policies, deviations in common practice, and any regulatory changes which may affect the originally

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50 See Par 49 of the Report of the AWG-KP on its seventh session, held in Bonn from 29 March to 8 April 2009. Available at: http://unfccc.int/resource/docs/2009/awg7/eng/05.pdf. Given the political nature of the entire approval process, technical review teams a balanced between developed and developing country experts.
51 The Parties agreed, for instance, that reference levels would be constructed taking into consideration: (i) removals or emissions from forest management as shown in greenhouse gas inventories and relevant historical data; (ii) age-class structure; (iii) forest management activities already undertaken; (iv) projected forest management activities under a business as usual scenario; and (iv) continuity with the treatment of forest management in the first commitment period.
52 See UNFCCC Decision 2/CMP.6 and its appendix II, part II - Guidelines for review of submissions of information on forest management reference levels. UN Doc FCCC/KP/CMP/2010/12/Add.1, pp. 9-12. Available at: http://unfccc.int/resource/docs/2010/cmp6/eng/12a01.pdf#page=5.
53 See ACR Nested REDD+ Standard, supra note 20, p.7: "The Standard also does not dictate to jurisdictions the manner in which they should design their accounting frameworks (e.g., reference levels...)"
54 See ACR Nested REDD+ Standard, supra note 20, section 1.3.
55 See Annex A, California Environment Protection Agency, Air Resources Board, Compliance Offset Protocol – US Forest Projects (hereafter "California ARB U.S. Project Offset Protocol"), Oct 2011. Available at: http://www.arb.ca.gov/regact/2010/capandtrade10/candtmodreg.pdf.
56 Some examples of standards with fixed period of validity of baselines include CarbonFix , where RL must be certified every 5 years; CAR, under which baselines are assumed to be valid for 100 years; and ACR and VCS, which both allow for 10 years.

used baseline. For instance, under the ACR, difference fixed crediting (and baseline) validity periods apply for different activities according to the risks associated with changing RLs premises and conditions. The project or program proponent is obliged to apply for a renewal of the crediting period once it expires. Once this period expires, any new requirements of the standard which were enacted during that previous crediting period will need to be accounted for. The ACR, however, does not specify how many times the crediting period may be renewed.

Under the VCS, in turn, crediting periods (and baselines) will be valid from 20 to 100 years. The actual baseline validity period is decided on a case-by-case basis and may be renewed up to four times only.[57] Under the CDM, project developers may choose between 20-year crediting periods, renewable twice, or a single 30-year crediting period.[58]

On the other hand, for most standards following the second model ('bottom-up submission of RLs with a negotiated and/or political endorsement process'), only minimum criteria associated with the review or re-validation will apply, with a new round of negotiations taking place to define any adjustments required to the RL. This was the experience observed with the modifications of the accounting framework for forest management under the Kyoto Protocol, including the negotiation of RLs. As the accounting rules had only been agreed for the first commitment period of the Kyoto Protocol, a new negotiation process was established to decide on the accounting system for the second commitment period. The main criteria used to define RLs, however, remained the same in both processes.

The procedural features under this second model of standards and initiatives normally provide for greater flexibility for parties to propose and construct their RLs (for instance, approaches to define area under forest management, pools considered and omitted, use of historical vs. projected approach). In addition, technical assessments tend to place a greater emphasis on data sources and consistency between previously informed GHG data and the elements used to construct the RL.[59] The VCS JNR, for instance, is currently in the process of negotiating collaboration agreements with countries and provinces that will pilot the VCS JNR guidelines issued in the beginning of 2012. Under these types of agreements, the relevant jurisdiction and the VCS will attempt to make consistent criteria carbon projects, including on the application of jurisdictional RLs.[60]

Under the third category, top-down determination of RLs, a central authority is normally tasked with the role of determining the RL. Rules are very prescriptive and participants have little flexibility in this process. Under the New Zealand PSFI, a pre-defined set of methodologies with specified forms of calculating carbon stock changes are made available to landowners participating in the program.[61] Only those landowners with land not forested on 1 January 1990 are eligible to receive carbon units. These are handled for every ton of carbon sequestered from January 2008 onward, under the stipulation that land must be registered by the end of 2012.

57 See VCS Standard, Version 3.3, Oct 2012, section 3.8.
58 See UNFCCC, Decision 5/CMP.1, Annex, par 23.
59 See FCCC/KP/AWG/2011/INF.2, Synthesis report of the technical assessments of the forest management reference level submissions, Nov 2011, p.6. Available at: http://unfccc.int/resource/docs/2011/awg16/eng/inf02.pdf
60 See VCS website news at http://v-c-s.org/news-events/news/december-newsletter-wrapping-2012
61 Either by using default values, for landowners with less than 100 hectares of eligible land, or by the filed measurement approach for those landowners with a 100 hectares or more.

In standards with a top-down approach for RLs, the administrator sets the period of validity of the RLs in a manner similar to the first category of standards analyzed above.[62] One particular difference, however, may be that in mandatory emissions trading schemes and other regulated standards, the rules are normally set by law and/or contractual arrangement between the participant and government. The government will normally reserve the right to unilaterally modify the previously approved accounting method and baseline methodology if it deems necessary, with the participant bearing any damages such changes may cause in the participants' expectations associated with carbon credits or units. For instance, under the New Zealand PFSI, the RLs are valid during the covenant entered into between the landowner and the Crown, which will last at least for 50 years. The methodologies used to calculated emissions and removals can, however, be updated from time to time and thus affect holdings or entitlements to carbon units by landowners.

62 For example, the Panda Standard establish that "at the conclusion of a Crediting Period, the Baseline Scenario Type must be reassessed", PS-AFOLU, 2011, 6.2. Baseline, p.26. Available at: http://www.pandastandard.org/downloads/PS-AFOLU_Sectoral_Specification.pdf

4. Assessment of Commonalities and Differences of RLs

Although RLs in all the existing standards and initiative share a core foundation (the idea of a performance benchmark or reference point for measuring results of mitigation efforts), they often have different nuances and functions depending on the context in which they apply and the purpose they serve. This includes how the standards or initiatives seek to achieve environmental integrity, the type of regime or process in which the standard or initiative is born (mandatory or voluntary, international or domestic), to what extent the standard or initiative will have a role in the carbon market, and whether social aspects are taken into consideration.

4.1. Environmental integrity

In standards and initiatives developed with the generation of tradable offsets in mind, the environmental integrity of each individual project is the primary concern. The environmental integrity objective is normally translated into the requirement that emissions reductions and removals be real, verifiable, quantifiable, and permanent.

For project-scale standards, such as the CDM, the Australian CFI, the VCS, and the ACR, this is mostly obtained through the requirement of demonstration of project additionality, independent validation of RLs and verification reductions and removals, as well as the creation of mechanisms to deal with reversals of carbon stocks. Domestic law-based project standards will also have 'enforceability,' or the ability to hold project proponents and market participants liable for misrepresentations and false statements, as a sub-component for both market and environmental integrity.

Jurisdictional standards, in turn, tend to ensure additionality of efforts by the use of a conservative RL or a crediting level below BAU RL. Independent verification or some model of technical review, as seen above, is also a requirement of most standards. However, given the political nature of jurisdictional RLs, this requirement sometimes may be relaxed. The ACR Nested REDD+, for instance, may allow (on a case-by-case review) the use of jurisdictions' own domestic validation procedures to validate jurisdictional accounting elements.[63]

Determination of counterfactual scenarios and demonstration of additionality are the main tools for ensuring this environmental integrity. Conversely, in jurisdictional-level standards and initiatives focusing on providing guidance for results-based payments, RLs will normally subsume the notion of additionality. The RL will include a projection of future developments (including policies and measures taken by the country) at the national, regional, or level. Environmental integrity in these instances is pursued through the use of conservative RLs, a transparent RL construction and review system, and a broader accounting scale that aims at mitigating the risk of leakage. This is the case with bilateral cooperation, such as with Brazil-Norway in the context of the Amazon Fund, Guyana and Norway, and the FCPF. The function of RLs in these cases is primarily to set out a transparent payment-for-performance system which optimizes the use of domestic and international resources.

In the context of regulated cap-and-trade programs and some types of domestic-law based standards, like the NZ PFSI and the NZ ETS, RLs also serve a different function with respect to the environmental integrity of the system. RLs are established to determine positive or negative incentives within the confined boundaries of a regulated system. Counterfactual scenarios are normally not a criterion for participation here. The focus on the environmental integrity of each individual mitigation effort is replaced by an emphasis on overall reduction in emissions or increase in removals (whether or not these would have occurred anyway) within the boundaries of the program.[64] Environmental integrity is thus achieved at the program level.

4.2. The nature of the initiative and main beneficiaries

The approach adopted to determine RLs is heavily influenced by the nature and type of the regime, forum, or process of which the standard or initiative is a part of. Standards which are set in the context of mandatory programs generally follow very strict and prescriptive top-down procedures for the determination, approval, review, and periodic adjustment of RLs. Little flexibility is given to project proponents or covered entities to maneuver around the established rules, which often come in the form of binding regulation. This is the case, for instance, with the standards established for forestry activities in the New Zealand ETS, the New Zealand PFSI, and RGGI. These reflect the fact that these standards are designed either to regulate domestic participants directly, or to create offsets which will feed into a related domestic cap-and-trade program (and thus must genuinely serve to compensate excess emissions within the domestic program).

On the other hand, initiatives emerging within multi-jurisdictional regimes or which have jurisdictions as one of the main beneficiaries, such as the UNFCCC, the GCF, and the VCS JNR, tend to be less prescriptive. Emphasis is placed on flexibility of rules in an attempt to co-opt broader participation by jurisdictions with varying technical and governance capacities. Rules in these standards are normally framed as good practice guidelines and essentially advance minimum criteria so as to avoid overly encroaching on jurisdictional decision-making.

In addition, transparency is a principle that gains particular importance under standards targeting jurisdictions, as most of the decisions regarding RLs fall within each jurisdiction's sole competence. RLs are not necessarily 'approved' but 'endorsed,' and verification procedures focus more on the data used by jurisdictions to construct their respective RLs (e.g., on how the jurisdictional boundary is established, inputs used to define emissions factors and historic deforestation rates) rather than on approving the final RL. Also, the use of national or regional adjustment factors in the construction of RLs is normally permitted, provided the assumptions are explained and justified using transparent data.

4.3. Market-related considerations

Market-related considerations also affect substantive and procedural features of RLs, such as the scope and process for approving RLs. For domestic law-based standards generating offsets that feed into the jurisdiction's own domestic systems, like the Australian CFI, RGGI, and the Compliance Offset Protocol for the California cap-

64 Under a cap-and-trade program where benchmarks and targets are set top-down, the primary objective is normally to entice positive behavioral changes of participants and there is less concern with the environmental integrity of each individual behavior. For instance, certain landowners under the NZ-ETS can receive incentives to keep their forests intact regardless of whether they had any intention to log or a risk of deforestation was associated with his/her land in the first place. However, cap-and-trade programs employ different mechanisms to review the strictness of reductions targets on a periodic basis, normally at the end of a trading period.

and-trade program, although achieving a net climate-positive effect is important (i.e., the quality of offsets), the quantity of offsets available is also a primary aspect of regulation. For example, RGGI's initial list of activities eligible to generate offsets explicitly takes into consideration the expected supply within RGGI participant jurisdictions and the ease with which the relevant offsetting criteria can be met. Projects are also geographically restricted to those located in the US.[65]

This concern is also apparent in the strictness of the accounting framework (in particular, RL determination and MRV) for crediting of jurisdictional programs. The recognition of sector-based credits from REDD[66] in developing countries under the California cap-and-trade program is a case in point. Sector-based credits are only issued if emissions reductions deviate significantly from the BAU RL. Initial discussions by ARB staff have ranged between a 25 to 50% deviation from BAU and trajectory based on net-zero emissions by 2020.[67] Similarly, the GCF's unofficial guidance also suggests the use of crediting baselines. One of the options considered is to establish a downward straight-line trajectory with step-wise reductions and a target of 50% gross deforestation from the BAU baseline by 2020.[68] Both scenarios would greatly reduce the potential of overall offset supply.

Conversely, voluntary project-scale standards generating offsets will often focus on rigorous rules to avoid erroneous or over-crediting (quality) but leave quantitative considerations aside.[69] As a result, the scope of eligible activities tends to be broader. Standards such as the VCS, ACR, and CAR tend to include the full scope of REDD+, and some like VCS and CAR will cross-approve baseline methodologies.

Besides quality and quantity, some market-related concerns may also be locale-specific. For instance, the adjustment of scope under the Panda Standard is closely controlled by its secretariat to ensure allowed activities are in line with strategic needs in China, such as focusing in areas where the CDM does not reach. Project location is limited to China, and auditors designated as 'local verifiers' follow a tailored accreditation and training process so as to build carbon market capacity in China.[70]

4.4. Social and environmental aspects

Other standards will have their RLs designed to fit purposes besides the generation of emission reductions and removals. Here, environmental and social considerations are regarded as something more than 'ancillary benefits.' Standards with a greater focus on sustainability of mitigation activities tend to also make use of multiple types of RLs in order to measure and assess economic, social, and environmental impacts. Examples

65 See Overview of RGGI CO2 Budget Trading Program, October 2007, at http://www.rggi.org/docs/program_summary_10_07.pdf, and RGGI Analysis Supporting Offset Limits Recommendation, May 2006. Available at: http://www.rggi.org/docs/offsets_limit_5_1_06.pdf

66 The California cap and trade program refers exclusively to Reducing Emissions from Deforestation and Forest Degradation (REDD) as a source for international sector-based offset credits. See Sources for Sector-Based Offset Credits (section 95993), in the California Cap-and-Trade Law, supra note 4.

67 See Bamberger B., Sector-Based Crediting & Subnational Reducing Emissions from Deforestation and Degradation (REDD), 2010, Office of Climate Change. Available at: http://www.arb.ca.gov/cc/capandtrade/meetings/073010/arbpresentation.pdf. Note the use of offsets (both domestic and sector-based) is currently limited under the California cap-and-trade program pursuant to section 95854 of the cap-and-trade regulations.

68 See GCF, Design Recommendations for Subnational REDD Frameworks (discussion draft), Aug 2011.

69 An exception is the CarbonFix standard, where eligible activities are limited to the conversion of no-forest to forest and makes use of a single methodology. See CarbonFix Methodology. Available at: http://www.carbonfix.info/chameleon//outbox//public/216/CFS-Methodology.pdf

70 See Panda Standard website at http://www.pandastandard.org/standard/audit.html

include standards like Plan Vivo and Brazil Mata Viva, which are designed to generate ecosystem services beyond carbon, as well initiatives like the Panda Standard, which attach greater emphasis to added social benefits.

Under Plan Vivo, additionality is ensured by the exclusive focus on small-producers, rural communities and forest dwellers that lack the technical, financial, and organizational capacity to implement mitigation activities. Plan Vivo also provides assessment tools and guidance for demonstrating and measuring enhancement of local biodiversity, as well as other ecosystem services in water and soil. The Panda Standard, in turn, offers a 'Poverty Alleviation Criteria Tool'[71] to project developers opting to demonstrate positive poverty reduction impacts.

Procedural aspects may be similarly designed to meet additional social and environmental benefits. In certain circumstances, Plan Vivo avails its own consultants to assist small farmers in the development of carbon modeling. In addition, the expertise of independent validators and verifiers may be geared towards other environmental and social aims rather than purely auditing of emissions-related processes. The Brazil Mata Viva's accredited verifiers include NGOs like *IDESA (Instituto de Desenvolvimento Econômico e Socioambiental),* whose objective is, among others, to promote sustainable development in rural and urban areas, capacity building for public services, and community-based work.

71 The Panda Standard Poverty Alleviation Criteria Tool is currently under development. See Panda Standard Association, Panda Standard Sectoral Specification for Agriculture, Forestry and Other Land Use (PS-AFOLU), 2011(hereafter "Panda Standard AFOLU Specification"), pp. 12-13. Available at: http://www.pandastandard.org/downloads/PS-AFOLU_Sectoral_Specification.pdf. http://www.pandastandard.org/downloads/PS-AFOLU_Sectoral_Specification_-_Public_Comment_V1.pdf

ANNEX

Detailed Overview of Forest Carbon Initiatives and Standards Guidance on Reference Levels

International Law-Based Initiatives and Standards

UNFCCC – REDD+

Substantive Guidance	
Scale	National level, with subnational as an interim step towards national implementation
Scope	Full scope of REDD+
Construction	Countries are given flexibility to develop their own methodologies for RL construction, subject to independent review and verification. RLs should also be built on transparent, complete, consistent and accurate information, including historical data. They should be consistent with national GHG Inventories and may consider national circumstances. Countries should move towards national RLs, but can develop sub-national RLs in the interim.
Additionality	No guidance yet. Assumed to be captured in national RL.
Procedural Guidance	
Process of submission, approval, and review	Country parties are to develop and propose their national RL or, if appropriate, subnational RL. The development of a RL is one of the elements necessary to qualify for results-based finance and REDD+ actions should be fully measured, reported and verified (MRV). Modalities and procedures for MRV and results-based finance are under negotiations.[72]

Kyoto Protocol - CDM

Substantive Guidance	
Scale	Project level
Scope	Afforestation and Reforestation
Construction	Project proponents make use of approved baseline construction methodologies, or propose a new methodology according to their A/R CDM project activity.[73] To help reduce uncertainties, methodologies should use, whenever possible, guidelines from the GPG-LULUCF, GPG-2000, the IPCC *Revised 2006 Guidelines* and tools and guidance approved by the CDM Executive Board on conservative estimation of emissions and removals.
Additionality	To be demonstrated for each project using the CDM-specific additionality tools, which include the *Tool for the Demonstration and Assessment of Additionality in A/R CDM Project Activities*, and *Combined Tool to Identify the Baseline Scenario and Demonstrate Additionality in A/R CDM Project Activities*.[74]

72 See Decision 2/CP.17, pars 64-73, and Decision 1/CP.16, pars 71.
73 See CDM, How-to Guide "Propose a methodology for afforestation and reforestation project activities." Available at: http://cdm.unfccc.int/Projects/pac/ar_howto/New_AR_Methodology/index.html.
74 See, respectively, the CDM Executive Board 35 Report, Annex 17 and 19.

Procedural Guidance	
Process of submission, approval, and review	RLs must comply with (1) Executive Board-approved requirements and (2) procedures for establishing new methodologies.[75] Project proponents should choose most appropriate baseline for project and justify based on past, existing or future changes in carbon stocks.[76] The appropriate use of an approved baseline methodology must be verified by an accredited Designated Operational Entity (DOE). Based on verification and approval, a project is registered as CDM project activity by the CDM Executive Board. A single crediting period of a maximum of 30 years or a period of 20 years with the possibility of renewal twice (totaling 60 years).[77]

Kyoto Protocol - JI

Substantive Guidance	
Scale	Project (nested in national LULUCF accounting)
Scope	Afforestation, Reforestation, Avoided Deforestation, Revegetation, and Forest Management (depends on elected LULUCF reporting of the host party).
Construction	Flexibility is given in developing tailored methodologies for RL construction provided that the baselines include "emissions from all gases, sectors and source categories listed in Annex A of the Kyoto Protocol, and anthropogenic removals by sinks, within the project boundary"[78] and incorporate the following five criteria: (1) project-specific basis or with a multi-project emission factor, (2) transparently showing relevant variables, (3) accounting for national and/or sectoral circumstances, (4) no reductions may be earned for non- or mal-performance, and (5) based on conservative assumptions.[79]
Additionality	Project-specific additionality has to be proven in the Project Design Document. CDM additionality tools can be used.
Procedural Guidance	
Process of submission, approval, and review	Under Track 1, the host party is responsible and makes project information available according to JI Guidelines.[80] Under Track 2, after the project proponent develops a baseline in accordance with the JI guidelines, the host party (and any other involved Parties) needs to approve the project. Finally, an Accredited Independent Entity (AIE) determines if the project's baseline meets JI guidelines criteria.[81] The Joint Implementation Supervisory Committee (JISC) approves Track 2 projects.

75 See Decision 19/CP.9, Modalities and procedures for afforestation and reforestation project.
76 Decision 5/CMP.1, Modalities and procedures for afforestation and reforestation.
77 Ibid., par 23.
78 Decision 9/CMP.1, Appendix B.
79 Ibid.
80 Joint Implementation Supervisory Committee (JISC). Guidance on criteria for baseline setting and monitoring, JISC 18, Annex 2, Oct 2009, par 28. Available at: http://ji.unfccc.int/Ref/Documents/Baseline_setting_and_monitoring.pdf.
81 Ibid., par 29.

Kyoto Protocol – Forest Management Reference Levels

Substantive Guidance	
Scale	Jurisdictional
Scope	Afforestation, Reforestation, Avoided Deforestation, Revegetation, and Forest Management (depends on elected LULUCF reporting of the host party).
Construction	Countries are given flexibility to develop their own methodologies for RL construction, subject to independent review and verification.
Additionality	Assumed to be captured in national RLs.
Procedural Guidance	
Process of submission, approval, and review	Each country Party initially shared (on a voluntary and informal basis) country-specific information and data regarding RLs, including tentative RL numbers.[82] Based on information and insights exchanged, the parties then negotiated the minimum criteria for constructing reference levels and proposed their respective RLs.[83] RLs submitted were subject to assessments by expert review teams, which raised inconsistencies and provided recommendations.[84]

Domestic Law-Based Initiatives and Standards

Australian CFI

Substantive Guidance	
Scale	Project level
Scope	Projects that sequester carbon or remove carbon dioxide from the atmosphere by sequestering carbon, and those that avoid emissions of greenhouses gases.
Construction	Baselines are addressed in specific methodologies as they are proposed and developed. Only a few forestry methodologies have been approved although several more are under consideration.[85] Baselines may be constructed from 1) historical emissions data 2) projected or modeled estimates of future emissions under various scenarios, or

82 See Report of the AWG-KP on its seventh session, Bonn, 29 Mar to 8 Apr 2009, par 49. Available at: http://unfccc.int/resource/docs/2009/awg7/eng/05.pdf. Given the political nature of the entire approval process, technical review teams are balanced between developed and developing country experts.
83 The Parties agreed, for instance, that reference levels would be constructed taking into consideration: (i) removals or emissions from forest management as shown in greenhouse gas inventories and relevant historical data; (ii) age-class structure; (iii) forest management activities already undertaken; (iv) projected forest management activities under a business as usual scenario; and (iv) continuity with the treatment of forest management in the first commitment period.
84 See Decision 2/CMP.6 and its appendix II, part II - Guidelines for review of submissions of information on forest management reference levels.
85 See Australian Government Department of Climate Change and Energy Efficiency, Overview of CFI Methodologies. Available at: http://www.climatechange.gov.au/government/initiatives/carbon-farming-initiative/factsheets/overview.aspx.

	3) comparison of monitored emissions from project area with those of an unabated comparison area (including proof that land used for comparison is operating in genuinely comparable circumstances and environmental conditions).[86]
Additionality	Two-part additionality test including (i) projects must not be required by law (regulatory surplus) and (ii) common practice test determined by activities on the positive list.
Procedural Guidance	
Process of submission, approval, and review	Requires submission by project proponents to the Domestic Offsets Integrity Committee (DOIC).[87] Before a methodology can be used by project developers, it must be endorsed by the DOIC and approved by the Minister for Climate Change and Energy Efficiency. Public consultations are also required. Baseline calculation methods may be reviewed and adjusted over time, and can be either amended or revoked during the crediting period.[88] Approved methodologies are made part of the CFI legislation.

New Zealand Permanent Forest Sink Initiative

Substantive Guidance	
Scale	Project level
Scope	Active establishment of new eligible forests by conversion of non-forest land to eligible forest through planting, seeding or promotion of natural seed sources.
Construction	Assessment of changes in carbon stocks are made with reference to the forest sink management plan and map of the forest sink area, as registered. Assessment of carbon stocks uses either pre-set default values (for land below 100 hectares) or field measurement approach (for land above 100 hectares). Only landowners with a permanent forest established after 1 January 1990 can participate.
Additionality	Not addressed
Procedural Guidance	
Process of submission, approval, and review	Landowners submit applications together with a forest sink management plan which describes procedures to be taken by the landowner to establish and maintain a permanent forest (and includes a map of the forest sink area). If application is approved, the landowner enters into a perpetual contract (covenant).[89] Methodologies for determining carbon stocks and the default carbon stock tables are pre-set in a top-down manner and can be updated from time to time.[90]

86 Australian Department of Climate Change and Energy Efficiency, Guidelines for submitting methodologies, Part 2, Step 3, available at: http://www.climatechange.gov.au/government/initiatives/carbon-farming-initiative/methodology-development/methodology-guidelines.aspx#part1.
87 See Australian Government, Carbon Credits (Carbon Farming Initiative) Act No. 101, 2011, Section 108. Available at: http://www.comlaw.gov.au/Details/C2011A00101/Download.
88 See Guidelines for submitting methodologies, Part 2, Step 6 *in fine*, Department of Climate Change and Energy Efficiency, available at: http://www.climatechange.gov.au/government/initiatives/carbon-farming-initiative/methodology-development/methodology-guidelines.aspx#part1.
89 New Zealand Ministry for Primary Industries, Website. Permanent Forest Sink Initiative, Nov 2012. Available at: http://www.mpi.govt.nz/forestry/funding-programmes/permanent-forest-sink-initiative.aspx.
90 See Ibid.

Japan Offset Credit (J-VER) Scheme

Substantive Guidance	
Scale	Project level
Scope	Forest thinning, afforestation, accelerated sustainable forest management.
Construction	The J-VER does not establish a baseline scenario for forest sink project types. The gross-net method of accounting is used based on calculation methods for CO2 absorption from the Kyoto Protocol. Each region's per-species and per-location harvest forecast table is applied and timber volume by age is calculated to determine annual trunk growth.[91] Calculations are made after setting various parameters, so actual credit amounts differ from project to project.[92]
Additionality	Additionality is addressed through the use of positive lists.
Procedural Guidance	
Process of submission, approval, and review	The Ministry of Environment and the Secretariat of the Offset Credit design and announce methodologies. The J-VER Steering Committee identifies project types that should be promoted and include these in positive lists.[93]

Subnational and Regional Initiatives

California (AB 32)

Compliance Offset Protocol – U.S. Forest Projects and Sector-Based Offset Credits

Substantive Guidance	
Scale	Project level & Sector level
Scope	Reforestation, Improved Forest Management, Avoided Conversion[94] **Sectoral**: REDD+ only implemented in developing country jurisdictions.
Construction	Compliance Offset Protocols need to provide for a conservative estimate of business-as-usual performance or practices for the project type and account of uncertainties in quantification factors.[95] Geographical boundaries must be specified and are limited to US.[96]

91 See Forest Carbon Asia, Standards and Verification, Dec 2012. Available at: http://www.j-ver.go.jp/document/e/pt/R001_R003_en.pdf.
92 See Ibid.
93 See Ministry of the Environment, Japan, Offset Credit (J-VER) Scheme, Nov 2011. Available at: http://www.j-ver.go.jp/document/e/J-VER_OutlineMoEJNov2011.pdf.
94 California ARB U.S. Project Offset Protocol, supra note 55.
95 See California Cap-and-Trade Law, Section 95972, "Requirements for Compliance Offset Protocols," supra note 4.

	Sectoral: Minimal legislative guidance is provided so far,[97] with future regulations or guidance likely to prescribe RL details. An unofficial 2010 California Air Resource Board (ARB) Staff Report suggests RLs to be set conservatively from "… absolute deforestation based on historic emissions averaged over a 10-year period and adjusted if necessary." Guidance also suggests jurisdictions "must set a crediting baseline based on specific targets for 2020 and beyond."[98] If nested approach is taken, project-based emissions reductions must be reconciled within sectoral accounting from the host jurisdiction.[99]
Additionality	Includes general requirements from California legislation, as well as additional requirements from the approved Compliance Offset Protocol. The California legislation requires: (i) regulatory surplus test; (ii) demonstration that emission reductions would not otherwise occur in a conservative BAU scenario; (iii) project commencement date not earlier than 31 December 2006; and (iv) that emission reductions exceed the baseline calculated in accordance with the relevant Compliance Offset Protocol. The Compliance Offset Protocol for US Forest Projects, in turn, requires a two-part additionality test including (i) regulatory surplus and (ii) a performance test indicating that the project goes beyond common practice.[100]
Procedural Guidance	
Process of submission, approval, and review	The Air Resources Board is responsible for approving Compliance Offset Protocols and an Offset Project Operator of Authorized Project Designee must approve RLs.[101] The crediting period (and baseline validity period) for sequestration offset projects must be between 10 and 30 years. The crediting period for offset projects using the Compliance Offset Protocol for US Forest Projects is 25 years. The baseline for forest projects under the first version of the Forest Offset Protocol is valid through the life of the project if the initial verification is successful and the project receives a Positive Verification Statement.[102] **Sectoral**: RLs to be submitted for approval to ARB, though potentially through existing partnerships.[103] RL review process not yet defined by ARB.

96 See California ARB U.S. Project Offset Protocol, supra note 55, Section 3.2, "Project Location" ("All Forest Projects must be located in the [US]. Reforestation Projects and Improved Forest Management Projects may be located on private land, or on state or municipal public land. Avoided Conversion Projects must be implemented on private land, unless the land is transferred to public ownership as part of the project.") *But see*, California Cap-and-Trade Law, supra note 4, Section 95972 (allowing ARB wider geographical discretion in that the "Compliance Offset Protocol … geographic boundary must be within the United States or its Territories, Canada, or Mexico.")
97 California Cap-and-Trade Law, supra note 4, Section 95994(a)(4), states that "transparent system for determining and reporting when it meets or exceeds its crediting baseline(s), and evaluating the performance of the program's sector during each program's crediting period relative to the business as usual or other emissions reference level."
98 California Environmental Protection Agency, ARB Staff Report (hereafter "ARB Staff Report"), at III-28. Available at: http://www.arb.ca.gov/regact/2010/capandtrade10/capisor.pdf.
99 California Cap-and-Trade Law, supra note 4, Sections 95993-94.
100 See Ibid., Section 95972, "Requirements for Compliance Offset Protocols."
101 California Cap-and-Trade Law, supra note 4, p. A-170..
102 See California ARB U.S. Project Offset Protocol, supra note 55, p.15.
103 See ARB Staff Report, supra note **Error! Bookmark not defined.**, at III-48. ("Staff also proposes that the first sectors to be considered for approval be developed through existing partnerships, such as the Governors' Climate and Forests Task Force (GCF) and the International Carbon Action Partnership (ICAP)").

Northeastern USA - Regional Greenhouse Gas Initiative

Substantive Guidance	
Scale	Project level
Scope	Afforestation and Reforestation
Construction	Project baseline is defined as the onsite carbon stocks at commencement of the A/R project. Unlike most other standards, soil carbon is a required pool.
Additionality	RGGI uses a standardized approach to additionality requiring projects: (i) started after 20 Dec. 2005, (ii) pass the regulatory surplus test, (iii) cannot receive funding or incentives from other programs funded by electricity or natural gas ratepayers, (iv) cannot be awarded credits from another GHG program, (v) cannot include electricity generation.
Procedural Guidance	
Process of submission, approval, and review	Project proponents submit a Consistency Application to the RGGI participating state to demonstrate compliance with relevant state regulatory requirements.[104] For offset projects located in a non-participating US state or jurisdiction, project proponents must show compliance with all requirements of the cooperating regulatory agency where the project is located.[105] The Regulatory Agency may review and independently audit any submission under the CO2 Budget Trading Program and adjust as appropriate information in the submissions.

Voluntary Carbon Market Standards

Verified Carbon Standard and Verified Carbon Standard – JNR

Substantive Guidance	
Scale	Project-level and Jurisdictional/Nested (JNR)
Scope	Afforestation, Reforestation and Revegetation (ARR), Agricultural Land Management (ALM), Improved Forest Management (IFM), REDD, Wetland Restoration and Conservation (WCR). **JNR**: All activities within a national and/or subnational jurisdiction, as selected by the jurisdiction. If a baseline already exists for a compliance program, whichever is more conservative shall be used.
Construction	All AFOLU project baselines must be developed according to the same general baseline rules as well as specific guidance for approved methodologies. ARR projects must follow either IPCC 2006 Inventory Guidelines or CDM-approved A/R methodologies.

104 Fact Sheet: RGGI Offsets, p.2. Available at: http://www.rggi.org/docs/RGGI_Offsets_in_Brief.pdf. Applicable requirements are stated in Section XX-10.5 "Sequestration of carbon due to afforestation," p.106. Available at: http://www.rggi.org/docs/Model%20Rule%20Revised%2012.31.08.pdf.
105 Ibid., Section XX-10.5, "Sequestration of carbon due to afforestation", p.97.

	IFM projects using project approach rather than performance/benchmark standard are to project the management plan through the project's life, while proving proponents meet: (1) normal historical practices evidenced by a documented (5-10 years of records) history of the operator, (2) legal requirements for forest management and land use in the area (unless evidence shown that common practice not in adherence with such rules), and (3) proof that environmental practices equal or exceed minimal standards of similar landowners in the area.[106] Baselines for REDD consist of both a land-use and land-cover (LU/LC) change component and an associated carbon stock change component. The former LU/LC component is addressed differently for the three eligible activities: **APD**: Avoiding Planned Deforestation **AUFDD**: Avoiding unplanned frontier deforestation and degradation **AUMDD**: Avoiding unplanned mosaic deforestation and degradation For APD, the project proponent must show that the area was intended to be cleared and calculate the rate of forest conversion based on common practice in the area (including carbon in harvested wood products prior to deforestation). Under AUFDD, proponents must show the project area is located geographically where D/D is likely to occur over the crediting period (including evidence of any related infrastructure that might be developed in the absence of the REDD project). AUMDD requires accounting for historical D/D rates and showing similarity between the regional baseline area and project area in "drivers of deforestation/degradation, landscape configuration, and socio-economic and cultural conditions."[107] **JNR**: Jurisdictional RLs are 10 year historic baseline; adjustment for national circumstances is possible. Jurisdictional baselines are fixed for 5-10 years and updated as defined by the jurisdiction. Where no UNFCCC jurisdictional baseline exists, it is developed based on historical reference period with two potential adjustment types: (1) at least two alternative jurisdictional baselines for next 10 years (based on (a) historical annual average emissions or removals for 8 to 12 years; and (b) historical trend of GHG emissions or removals based on changes over last 10 years, both ending within 2 years of start of current jurisdictional baseline period); and (2) modeled adjustments reflecting national or subnational circumstances.[108]
Additionality	Additionality must be demonstrated at the project level according to the requirements of the project methodology, although activity method methodologies (positive list) need not follow additionality requirements.[109] The *Tool for demonstration and assessment of additionality* may be applied stand-alone to assess additionality.[110] The validation of the Project Description (PD) must include an assessment of additionality. **JNR**: For jurisdictional RLs, additionality is factored in.[111]

106 Verified Carbon Standard, Guidance for Agriculture, Forestry and Other Land Use Projects (hereafter "VCS AFOLU Guidance"), Nov 2008, pp. 19-20. Available at: http://v-c-s.org/sites/v-c-s.org/files/Guidance%20for%20AFOLU%20Projects.pdf.
107 Ibid., pp. 20.
108 Verified Carbon Standard, Jurisdictional and Nested REDD+ (JNR) Requirements v3.0 (hereafter "VCS JNR Requirements"), Oct 2012, p.26. Available at: http://v-c-s.org/sites/v-c-s.org/files/Jurisdictional%20and%20Nested%20REDD%2B%20Requirements%2C%20v3.0.pdf.
109 See Verified Carbon Standard, VCS Standard v.3.3., Oct 2012, p. 3. Available at: http://v-c-s.org/sites/v-c-s.org/files/VCS%20Standard,%20v3.3.pdf.
110 VCS AFOLU Guidance, supra note 106, p. 41.
111 VCS JNR Requirements, supra note 108, p. 21.

Procedural Guidance	
Process of submission, approval, and review	Project proponents are to use the VCS *Tool for AFOLU Methodological Issues* to determine baseline and carbon pools.[112] A Validation/Verification Body (VVB) must approve the baseline. CDM and JI methodology elements are automatically approved under the VCS Program.[113] Project baselines and jurisdictional RLs are valid for 10 years. "For all REDD projects types, project proponents must reassess the project baseline at least once every 10 years."[114] **JNR:** Entities submitting jurisdictional or nested project RLs must be jurisdictional authorities with appropriate power or adhere to and show evidence of adherence to domestic regulations covering relevant government approvals.[115] Only jurisdictional entities or authorized proponents may submit REDD+ programs and baselines to VCS for registration. Further VCS guidance on JNR registration, validation and verification forthcoming.[116]

American Carbon Registry and American Carbon Registry Nested REDD+

Substantive Guidance	
Scale	Stand-alone projects and projects nested in jurisdictional-level programs
Scope	Full Scope of REDD+ for both projects and nested, including REDD, afforestation, reforestation, and improved forest management
Construction	For all activity types, emissions and/or removals are to be calculated separately for each relevant source, sink and reservoir.[117] A/R baselines are the carbon stock present immediately before beginning a project or the most likely carbon stock without the project. If trees are already on the project site project proponents only count sequestration in pre-existing trees as offsets if their growth is also projected in the baseline. IFM baselines should consider credible alternative scenarios to that proposed including historically-based and common practice forest management for that area, and should include accounting for wood products. IFM performance standard baselines may be used where not based on a single carbon stock or forest/region type. For REDD, project proponents are to identify the deforestation the project will address and the relevant geographic range in order to address potential regional leakage (the ACR *Tool for Determining REDD Project Baseline and Additionality* should be applied).[118] REDD project baselines should account for planned (legal) deforestation directly as what would have happened in the absence of project activities (as determined by documentation) and unplanned (illegal) deforestation baselines should be modeled.

112 VCS AFOLU Guidance, supra note 106, p. 6.
113 Ibid., p. 9.
114 Ibid., p. 20.
115 VCS JNR Requirements, supra note 108, pp. 51-52 (additionally noting where no such regulations exist, jurisdictional proponent must obtain no-objection letter to submit jurisdictional baseline, and that nested projects are to follow REDD+ jurisdictional approvals process or else obtain no-objection letter from jurisdiction).
116 See Ibid., pp. 51-52.
117 See American Carbon Registry, ACR Standard v.2.1, Oct. 2010, p. 11. Available at: http://americancarbonregistry.org/carbon-accounting/ACR%20Forest%20Carbon%20Project%20Standard%20v2.1.pdf.
118 American Carbon Registry, Forest Carbon Project Standard (hereafter "ACR Forest Carbon Project Standard"), pp.36-37. Available at: http://americancarbonregistry.org/carbon-accounting/forest-carbon-project-standard-v2.0/ACR%20Forest%20Carbon%20Project%20Standard%20v2.1.pdf.

	The ACR standard provides three baseline modules according to the project activity: **BL-PL** "Estimation of baseline carbon stock changes and GHG emissions from planned deforestation" **BL-UP** "Estimation of baseline carbon stock changes and GHG emissions from unplanned deforestation" **BL-DFW** "Estimation of baseline emission from forest degradation caused by extraction of wood for fuel"[119] In the BL-PL's baseline modules, "deforestation in the proxy area shall have occurred within the 10 years prior to the baseline period."[120] In BL-UP: "The historical reference period shall at a minimum be defined by the years between the three spatial data points." "Three time points over a maximum of 12 years must be included, however, additional points either within or beyond the 12 year period may be added to enhance the deforestation analysis".[121] Finally, in *BL-DFW* module, "sampling techniques can be used… When using other sources of information, average data from a 5- to 10-year time period preceding the starting date of the project activity shall be used whenever possible (a different time period can be used where justified)."[122] **Nested REDD+**: Nested REDD+ projects must also meet requirements under the ACR Forest Carbon Project Standard and "apply an ACR-approved REDD+ methodology to address all project elements not included in an acceptable jurisdictional accounting framework."[123] The baseline unit may be determined by jurisdictions.
Additionality	Projects must start after Nov. 1, 1997 and use either an approved additionality tool (e.g. *CDM Additionality Tool* or *ACR Tool for Determining REDD Project Baseline and Additionality*) or pass test for (i) regulatory surplus, where project activities must go beyond any activities required by law, (ii) common practice, and (iii) implementation barriers (financial, technological, institutional).[124] **Nested REDD+**: Nested projects within a jurisdiction with an approved baseline do not need to prove additionality; projects lacking such must register as non-nested and follow project-level requirements.[125]
Procedural Guidance	
Process of submission, approval, and review	The baseline and demonstration of additionality shall be assessed by an ACR-approved verifier.[126]

119 American Carbon Registry, REDD Methodology Modules. Available at: http://americancarbonregistry.org/carbon-accounting/carbon-accounting/redd-methodology-modules-1.
120 American Carbon Registry, REDD Methodology Modules, "Estimation of baseline carbon stock changes and GHG emissions from planned deforestation (BL-PL)", p.6. Available at: http://americancarbonregistry.org/carbon-accounting/bl-pl.
121 Ibid., p.10-11.
122 ACR REDD Methodology Modules, "Estimation of baseline emission from forest degradation caused by extraction of wood for fuel (BL-DFW), p.3. Available at: http://americancarbonregistry.org/carbon-accounting/bl-dfw.
123 ACR Nested REDD+ Standard, supra note 20, p. 10.
124 ACR Forest Carbon Project Standard, supra note 118, pp. 23-24.
125 ACR Nested REDD+ Standard, supra note 20, p. 10.
126 American Carbon Registry, Tool for Determining the Baseline and Assessing Additionality in REDD Project Activities, p.1. Available at: http://americancarbonregistry.org/carbon-accounting/ACR%20Tool%20for%20Determining%20the%20Baseline%20and%20Assessing%20Additionality%20in%20REDD%20Project%20Activities.pdf.

	Nested REDD+: Jurisdictional baselines "shall be (or planned to be) re-evaluated every 10 years, or more frequently when a specific event triggers the need for an update."[127] RLs for nested RLs require validation/verification by ACR-approved independent body as under stand-alone projects, and "[a]ll monitoring and validation/verification requirements listed in the ACR Forest Carbon Project Standard and the ACR Validation/Verification Guideline for GHG Projects."[128]

CarbonFix

To be merged in 2013 into The Gold Standard "New Forests & Agroforestry" new project scope

Substantive Guidance	
Scale	Project-level[129]
Scope	Afforestation, reforestation, natural regeneration, and agro-forestry projects
Construction	There is only one methodology which is applied to all projects. This is based on the *2006 IPCC Guidelines* and on approved CDM methodologies.[130] The baseline is the sum of carbon stocks on the eligible planting area prior to planting. Carbon pools include above and below ground woody biomass and non-woody biomass.[131] The CFS uses the stationary baseline approach where no continuous monitoring is required.[132]
Additionality	CDM A/R Additionality Tool is used with (i) barrier analysis, (ii) investment analysis, and (iii) common practice analysis.[133]
Procedural Guidance	
Process of submission, approval, and review	Submission process managed through inputs from the Gold Standard, Forest Stewardship Council (FSC), market experts and governments (who are normally also market experts), as well as the TAC (internal technical advisory board).[134] RL approval conducted by auditors accredited under the UNFCCC or FSC, with inputs from the Gold Standard, Forest Stewardship Council (FSC), market experts and governments (who are normally also market experts), as well as the Technical Advisory Board.

127 ACR Nested REDD+ Standard, supra note 20, point 2.4.8, p.17.
128 Ibid., p.10.
129 According to inputs received by email from CarbonFix/The Gold Standard staff, some governments may implement the standard on a country-wide approach.
130 See CarbonFix Standard, CFS Methodology (hereafter "CFS Methodology"), p. 1. Available at: http://www.carbonfix.info/chameleon//outbox//public/216/CFS-Methodology.pdf.
131 See CarbonFix Standard v3.2, Dec 2011 (hereafter "CFS Standard"), p. 16. Available at: http://www.carbonfix.info/chameleon//outbox//public/214/CFS-v32.pdf.
132 See CFS Methodology, supra note 130, p. 4.
133 See CFS Standard, supra note 131, p. 12.
134 Inputs received via email communication with CarbonFix/The Gold Standard staff.

Climate Action Reserve

Substantive Guidance	
Scale	Project-level (US and Mexico)
Scope	Full Scope including avoided conversion, afforestation, reforestation, and improved forest management.
Construction	A 100-year baseline modeling of carbon stocks is used for all required and selected optional carbon pools, which is not to be modified during this 100 year period. The GHG assessment boundary includes all sources, sinks, and reservoirs that could be significantly impacted by project activity. All project types must account for harvested wood products in their baseline.[135] **Improved Forest Management**: established by modeling (using an approved growth model) a growth and harvest projection which meets all legal requirements and financial constraints and results in an average tCO2-e/acre greater than or equal to the value of Minimum Baseline Level (MBL) as determined in Section 6.2 of the Forest Project Protocol for the project. The MBL is the result of the aforementioned modeling exercise and policies related to past management, and regional and ownership management patterns.[136] **Reforestation**: established by modeling a qualitative characterization of the likely vegetative conditions and activities that would have occurred in the absence of the project, accounting for any legal mandates that may encourage reforestation activities. Must additionally inventory all onsite carbon pools prior to project site preparation activities. Baselines must be updated with more rigorous inventory data at the time the project stocks are verified for crediting.[137] **Avoided Conversion**: established by identifying alternative highest-value land use through an official appraisal, then utilizing the protocol's standardized guidance of conversion to guide the 100-year modeling.[138]
Additionality	"Standardized" approach used whereby project characteristics are measured against sectoral standards to determine additionality, as opposed to a project-based approach that compares a project scenario to alternative scenarios.
Procedural Guidance	
Process of submission, approval, and review	Before a forest project and its baseline can become eligible for CAR registration, its Operator must enter into a Project Implementation Agreement (PIA) with the Reserve. The Reserve reviews the verification documents, and then the PIA is recorded and submitted before it registers the project.[139] Forest project baselines are assumed to be valid for 100 years for projects registered with the ACR Forest Project Protocol.[140] The original baseline is terminated automatically in case of a reversal that lowers the project's standing carbon stocks below its approved baseline.[141]

135 Inputs received via email communication with CAR staff.
136 Ibid.
137 Ibid.
138 Ibid.
139 See CAR Forest Project Protocol, supra note 21, p. 12.
140 Ibid., p. 10.
141 Ibid., p. 72.

Plan Vivo

Substantive Guidance	
Scale	Project-level
Scope	Afforestation, reforestation (non-commercial plantations), agroforestry, avoided deforestation, forest conservation and restoration. Standard is targeted towards small scale projects.
Construction	Standard requires a "credible and comprehensive baseline scenario defined clearly using appropriate indicators."[142] Technical specification methodologies are required for entire land use systems (including carbon sequestration potential of an activity for a given time interval), which are compared with actual Plan Vivo project areas to assess activity offset potentials. This avoids the need for individual baseline studies for each project area.[143]
Additionality	Project proponents are to use Plan Vivo additionality tool, with tests for (i) project additionality demonstrated by no support from external legislation or commercial interests, (ii) barriers analysis, and (iii) common practice analysis.[144]
Procedural Guidance	
Process of submission, approval, and review	External consultants and local educational/research institutes may be required to source data and assist in developing technical specifications, and specifically to support the project technical team.[145] Technical specifications including baseline studies need to be reviewed by an independent expert and by the Plan Vivo Technical Advisory Panel before project approval. Technical specifications including baseline studies are reviewed every 5 years and subject to re-approval from Plan Vivo Foundation.[146]

Regional Standards

Panda Standard

Substantive Guidance	
Scale	Project-level (China only)
Scope	Improved Forest Management (IFM) and Forestation and Vegetation Increase (F-V) (A/R)
Construction	Baselines must comply with approved PS-AFOLU Methodologies. Only CDM large and small-scale A/R methodologies are currently approved although others are under the approval process.

142 Plan Vivo Standards 2008, Oct 2008, (hereafter "Plan Vivo Standards 2008"), p. 31. Available at: http://www.planvivo.org/wp-content/uploads/Plan-Vivo-Standards-20081.pdf.
143 See Plan Vivo Manual: Guidance for Developing Projects, p. 23. Available at: http://planvivo.org.34spreview.com/wp-content/uploads/Guidance-manual_Plan-Vivo.pdf.
144 See Ibid., pp. 24-33.
145 Plan Vivo Standards 2008, supra note 142, p. 30.
146 Ibid.

Additionality	Three-prong test, including a (i) regulatory compliance test, (ii) common practice test, (iii) and barriers test for investment, technological, or institutional barriers. Alternatively, a performance standard approach can be used if a methodology is developed that develops appropriate performance benchmarks.
Procedural Guidance	
Process of submission, approval, and review	Projects proponents submit baseline methodologies for approval by the Panda Standard secretariat. Final approval requires pre-approval by the Technical Committee and public consultation period for the methodology. Baselines are valid for a fixed period as determined in the relevant methodology, which shall not be less than 5 years or more than 30 years. Renewal of the crediting period requires a re-assessment and re-validation of the baseline.[147]

Brasil Mata Viva

Substantive Guidance	
Scale	Project-level (Brazil)
Scope	Forest Protection Projects; Biodiversity Protection Projects; Watershed Protection Projects; Life Protection Projects; as well as Culture and Traditional Society Protection Projects (still in development).
Construction	RL are constructed via experts/BMV research. Baseline defined by regional and local historical emissions, agricultural potential, deforestation issues, legislation, capacity and land use value. Monitored and validated by score system through ASE Protocol for sustainable development indicators.[148]
Additionality	No ex-ante additionality test.
Procedural Guidance	
Process of submission, approval, and review	The approval is made by independent third party and audited by UNESP (Sao Paulo State University). RLs are monitored annually by an independent third party and audited by UNESP, with revalidation every five years (including of additionality).[149]

Multilateral Standards

Forest Carbon Partnership Facility – Carbon Fund

Substantive Guidance	
Scale	National and subnational REDD+ (subnational programs occurring at large scale and ambition, with national government(s) endorsement)
Scope	Full scope of REDD+
Construction	Details of the Carbon Fund Methodological Framework (MF) are still under

147 See Panda Standard AFOLU Specification, supra note 71, pp. 26-27.
148 Inputs received via email communication with BMV staff.
149 Ibid.

	development, but preliminary discussions suggest RLs are likely to require clearly documented methodology and potentially a step-wise approach to development, with geo-referenced and nested subnational RLs. Adjustments for relevant national circumstances may be acceptable if credible and defendable, but this point has not yet been addressed.[150] Subnational baselines will need to be consistent with, or informed by, approaches being used to establish a national REDD+ RL and MRV system.[151]
Additionality	Dependent on MF decisions and on national REDD+ MRV and REDD+ strategy framework.[152]
Procedural Guidance	
Process of submission, approval, and review	FCPF and Carbon Fund Participants assess early proposals for emission reductions programs that include RLs that are submitted by participating countries or authorized subnational entities, select proposals for the Carbon Fund portfolio and provide advice on how to improve them. Then REDD+ countries or entities revise proposals including RLs and submit a final version for approval.153 Evidence that the REL/RL has undergone public consultation and peer review is required.[154] The Emission Reductions (ER) program is approved by Carbon Fund Participants, within this ER program, where the reference scenario is one of the aspects to be considered. Ex-ante assessments are likely to be required by an independent third party peer review experts of an ER Program including its Reference Scenario before the implementation of the Emission Reductions Program, but details are not yet agreed for this process.[155] Public consultation will be required in the approval process of the RL.

Governors' Climate and Forests Task Force (GCF)

Substantive Guidance	
Scale	Subnational jurisdictional level with recommendations on 'nesting' of projects.
Scope	Full scope of REDD+
Construction	GCF members agree that RL and baseline methodologies should be flexible to capture varying jurisdictions' circumstances while meeting the needs of evolving compliance regimes (potentially including a single, shared baseline for multiple states).[156] The GCF

150 See Forest Carbon Partnership Facility, Readiness Package Content and Assessment Approach Concept Note (draft), Dec 2011, p. 16. Available at: http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/FMT%20Note%202011-14%20Readiness%20Package%20Concept.pdf.
151 See Forest Carbon Partnership Facility, Pioneering performance-based payments for REDD+ (hereafter "Pioneering REDD+"), Jun 2012, p. 4. Available at: http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/June2012/Brochure.pdf.
152 See Brown, S. Technical Workshop on Reference Levels for REDD+, World Bank, Nov 2011 (Presentation), available at: http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/Nov2011/2-%20Overview%20of%20FCPF%20country%20approaches%20to%20RLs-Winrock-Nov8,2011.pdf.
153 See Pioneering REDD+, supra note 151, Jun 2012, p. 3.
154 See Readiness Package Content and Assessment Approach Concept Note (draft), Dec 2011.
155 See International Bank for Reconstruction and Development (2011) Charter Establishing The Forest Carbon Partnership Facility. pp. 32-33 (establishing Facility Management Team of FCPF, including power to conduct ex ante assessments, as defined in same Charter at p.4). Available at: http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/May2011/FCPF%20Charter%20-%20CF%2005-11-2011%20clean.pdf.
156 See Governors' Climate and Forests Task Force, GCF Task Force Joint Action Plan (2009), p. 16. Available at: http://www.gcftaskforce.org/documents/GCTF-1000-2009-031.pdf.

	also provides unofficial guidance (not yet formally endorsed by all GCF participants) in which it suggests the use of historical averages of annual deforestation rates based on spatially-explicit activity data and a 5-10 year reference period. Guidance further suggests using an adjustment factor to address high forest stock/low historic deforestation scenarios.[157]
Additionality	Unofficial guidance suggests subsuming additionality via a crediting baseline.[158]
Procedural Guidance	
Process of submission, approval, and review	No particular approval procedure. Sharing of information on online repository and discussions during annual meetings and workshops help in determining guidance on constructing RLs.

Bilateral Standards

Norway – Guyana REDD+ Investment Fund (GRIF)

Substantive Guidance	
Scale	Jurisdictional (Guyana, country-wide)
Scope	Only reduced emissions from deforestation initially with other REDD+ activities addressed in the future.
Construction	Combined Reference Level: The level in the Norway agreement is calculated from an analysis of Guyana's historical deforestation baseline for 2000-2009 (0.03%) and the global average deforestation rate of 0.52% from 2005-2010 (both sourced from FAO data).[159] Although the reference level has been set at 0.275%, the crediting baseline has been amended so that Guyana receives progressively less compensation as thedeforestation rate rises above 0.056%, and no compensation if the deforestation rate rises above 0.1%.[160]
Additionality	The RL is meant to ensure additionality.
Procedural Guidance	
Process of submission, approval, and review	Through bilateral negotiations and agreement.

157 See GCF Design Recommendations, supra note 24, at 12.
158 Ibid., at 13. (noting crediting baselines potentially defined as a downward trajectory "with step-wise reductions and a target of 50 percent reductions in gross deforestation from the reference level baseline by 2020, with an additional requirement to maintain xx% of stocks, where crediting is only possible if emissions are below the crediting baseline in each crediting period.")
159 Norway Ministry of the Environment, Guyana-Norway partnership on climate and forests, "Joint Concept Note," Dec 2012, "Section 3: REDD-plus performance indicators, pp. 5-6. Available at: http://www.regjeringen.no/upload/MD/2012/Nyheter/JCN_2012_final.pdf.
160 See Norway Ministry of the Environment, "Questions and Answers: Latest developments of the Guyana-Norway REDD+ Partnership," Mar 2011, pp. 1-2. Available at: http://www.regjeringen.no/upload/MD/2011/vedlegg/klima/klima_skogprosjektet/Guyana/GuyanaNorwayQandA_310311.pdf

Indonesia – Norway REDD+ Partnership

Substantive Guidance	
Scale	Jurisdictional (select provinces in Indonesia)
Scope	Avoided deforestation, forest degradation or peatland conversion/destruction
Construction	RLs are set either at a UNFCCC level or domestically according to Indonesia's emissions reductions pledges and UNFCCC methodological guidance.[161]
Additionality	The national RL is meant to ensure additionality.
Procedural Guidance	
Process of submission, approval, and review	Through bilateral negotiations and agreement.

Norway – Amazon Fund (Brazil)

Substantive Guidance	
Scale	Project (supported by Amazon Fund); Jurisdictional (payment from Norway to Fund).
Scope	REDD, Conservation, Sustainable Forest Management, Recovery of Deforested Areas. Other capacity building activities are funded by the Amazon Fund that do not directly create emission reductions.
Construction	Payments from Norway to the Amazon funds are based on reference emission levels of a 10-year rolling average of historical deforestation.[162] Mitigation benefit estimated through CO2 proxies using a conservative assumption of 100tC/ha in all areas.[163]
Additionality	Unclear requirements for applicant projects
Procedural Guidance	
Process of submission, approval, and review	Baseline bilaterally negotiated. Proposals for adjustments made by the Ministry of Environment and reviewed by the Fund's Technical Committee.[164] The Brazilian national RL is to be updated automatically every five years.[165]

161 Government of the Kingdom of Norway and the Government of the Republic of Indonesia. May 2010. Letter of Intent on cooperation on reducing greenhouse gas emissions from deforestation and forest degradation, (hereafter "Norway-Indonesia Letter of Intent"), p. 4. Available at: http://www.forestsclimatechange.org/fileadmin/photos/Norway-Indonesia-LoI.pdf.
162 MMA - Brazilian Forest Service. Amazon Fund – Project Document (hereafter "Amazon Fund Project Document"). Nov 2008, p. 9. Available at: http://www.amazonfund.gov.br/FundoAmazonia/export/sites/default/site_en/Galerias/Arquivos/Boletins/Amazon_Fund_-_Project_Document_Vs_18-11-2008.pdf.
163 Ibid., p. 11.
164 See Amazon Fund. "Purposes and Management," (online article). Available at: http://www.amazonfund.gov.br/FundoAmazonia/fam/site_en/Esquerdo/Fundo/. See also Meridian Institute. "Guidelines for REDD+ Reference Levels: Principles and Recommendations" Prepared for the Government of Norway, p.12. Available at: http://www.redd-oar.org/links/REED+RL.pdf.
165 Amazon Fund Project Document, supra note 89, p. 9.

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