

Climate Change Authority

Stocktake and analysis of
international carbon offset
programs

8 June 2022

Contents

1	Executive Summary	4
2	Introduction	11
3	Approach	13
4	Analysis	25
	Overall results	25
	Principles	26
	Governance	32
	Operational performance	37
	The Joint Crediting Mechanism	44
5	Conclusions	46
6	Appendices	48

Release notice

Ernst & Young ("EY") was engaged on the instructions of the Climate Change Authority ("the Authority") to undertake to prepare a report summarising the analysis of international carbon offset programs ("Report"), in accordance with the engagement agreement dated 13 April 2022.

This report must not be relied upon by any party other than the Authority. EY disclaims all responsibility to any other party for any loss or liability that the other party may suffer or incur arising from or relating to or in any way connected with the Report, the provision of the Report to the other party or the reliance upon the Report by the other party.

Acronyms

Acronyms	
ACR	American Carbon Registry
CAR	Climate Action Reserve
CDM	Clean Development Mechanism
CER	Certified Emissions Reductions
CTX	Carbon Trade Exchange
ERF	(Australia's) Emissions Reduction Fund
GCC	Global Carbon Council
GHG	Greenhouse gas
GS	Gold Standard
IAF	International Accreditation Forum
IPCOS	Indo-Pacific Carbon Offsets Scheme
JCM	(Japan's) Joint Crediting System
KETS	Korea's Emissions Trading Scheme
KPI	Key Performance Indicator
MRV	Measurement, Reporting & Verification
NDC	Nationally Determined Contributions
PD	Project Developer
PDD	Project Design Document
RE	Reducing Emissions
REDD+	Reducing Emissions from Deforestation and forest Degradation, plus the sustainable management of forests, and the conservation and enhancement of forest carbon stocks
SDGs	Sustainable Development Goals
VCM	Voluntary Carbon Market
VCS	Verified Carbon Standard
VCU	(Verra's) Verified Carbon Unit
VVB	Validation & Verification Body

1 Executive summary

If offsets are going to play the important role required of them within our global transition to net zero, then assuring their integrity is a crucial part of their adoption. Our analysis has highlighted that the leading offset schemes have put a lot of the required architecture for this integrity in place.

The momentum in the international climate agenda experienced in the Conference of Parties 26 (“COP26”), held in Glasgow in November 2021, has led to an upswell of organisations and countries committing to net zero targets and aligning to the goals of Paris Agreement. In addition to climate mitigation strategies, carbon offsetting will play a fundamental role in assisting countries and organisation to achieve their interim and ultimate targets. This exponential growth will continue to drive scrutiny over voluntary carbon markets from international bodies, organisations and consumers.

In 2022, the Minister for Industry, Energy and Emissions Reduction requested the Climate Change Authority (“the Authority”) to conduct a review of the assessment principles for international offsets. In particular, the Authority’s review will provide advice on:

The use of international offsets under the Government’s Climate Active program

The development of the Indo-Pacific Carbon Offsets Scheme

Criteria relating to the use of offsets for other policies and programs

The objective of this report is to assist the Authority in the provision of the advice to the Minister through:

1

Undertaking a stocktake of international offsets schemes and programs

2

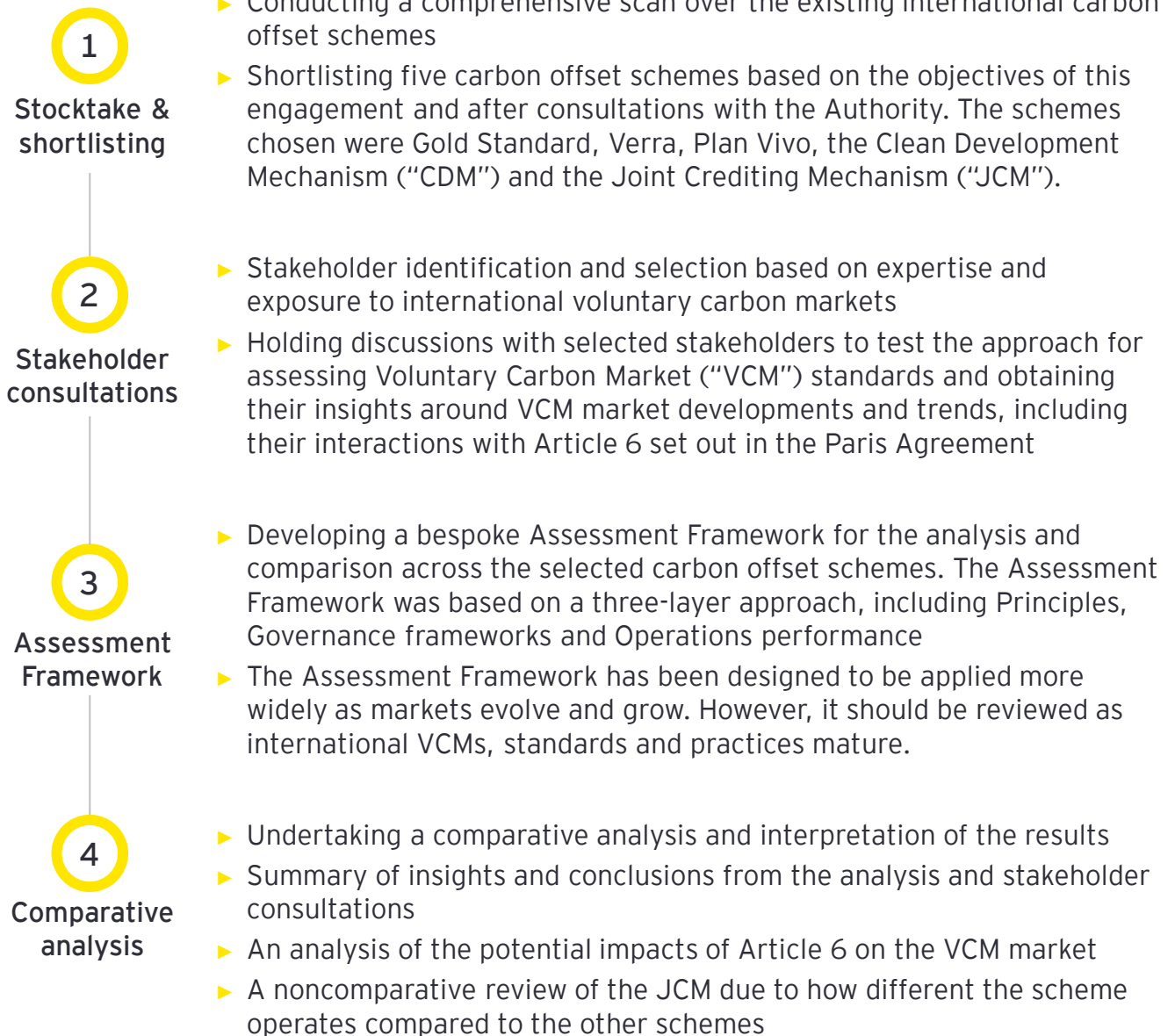
Designing an Assessment Framework for examining and comparing the quality of offsets

3

Conducting a comparative analysis of shortlisted schemes based on the Assessment Framework and feedback from stakeholder consultations

1. Executive summary

EY's approach to undertake the stocktake and analysis of international carbon offset schemes comprised four steps outlined below.



Schemes were rated independently per a series of criteria across the principles and governance layers. The scores out of 100% correspond to a shade of green as shown in the scale bar:



A “*note” approach was used to highlight important sub-criteria and to ensure that crucial details didn't get subsumed within a higher overall criteria score. A *note response was triggered (with the symbol *) if a scheme did not score highly enough on an important sub-criteria, such as having a conflict of interest policy for maintaining independence when certifying projects.

1. Executive summary

Table 1 summarised the scores for each criteria across the selected schemes, including any *notes linked to key criteria that should be considered. JCM was analysed outside of this Framework as it's different structure made it challenging to assess in the same manner as the other schemes. A summary of JCM is included later in the Executive Summary.

Table 1: Comparative analysis of shortlisted schemes against the Assessment Framework

Layer	Gold Standard		Verra		Plan Vivo		CDM	
	Score	*Note	Score	*Note	Score	*Note	Score	*Note
Principles	95%		87%		81%		74%	
Governance	88%		91%		70%	*	67%	*
Overall weighted average score	91%		89%		75%	*	70%	*

Key findings

Gold Standard obtained the highest overall weighted average score for principles

- ▶ Gold Standard is the leading scheme for a number of principles, including double issuance, transparency, leakage avoidance and safeguards against negative impacts. Gold Standard has a range of controls in place for managing offset quality, such as requiring all projects to demonstrate financial additionality and ongoing financial need through a publicly available design document.
- ▶ All other schemes showed strong alignment to the principles outlined in the Assessment Framework but had areas for improvement, including:
 - ▶ Plan Vivo and CDM encourage reporting on non-carbon benefits but do not make this a strict requirement, nor do these schemes require alignment with the United Nations Sustainable Development Goals ("SDGs").
- ▶ None of the schemes raised *notes for their performance against principles.

Verra and Gold Standard were the leading international offset schemes for governance

- ▶ Verra and Gold Standard show consistently high performance results in almost all governance criteria. This is due to having clear policies and thorough procedures in place, as well as its provision of ample supporting evidence online.
- ▶ Plan Vivo and CDM showed strong alignment with a number of criteria, however had some areas for improvement, including:
 - ▶ Both Plan Vivo and CDM could provide more information online, as they scored poorly due to lack of information
 - ▶ Plan Vivo and CDM raised *notes for not publishing an internal conflict of interest policies, risking the independence of their board and employees
 - ▶ CDM raised a *note for methodology certification by not using independent verifiers in their methodology review process
 - ▶ CDM raised a *note due to measurement, reporting and verification ("MRV") procedures for not requiring all projects to meet permanence checks. CDM only requires permanence checks in the case of afforestation or reforestation projects.

1. Executive summary

Article 6

Article 6 in the Paris Agreement is intended to provide a framework that allows for international trading of carbon offsets which can be used towards meeting national emission reduction commitments. These carbon offsets are called “mitigation outcomes” in the language of the Paris Agreement.

Article 6.2 sets up a bilateral framework that provides for the exchange of mitigation outcomes between partnering countries, whereas 6.4 establishes a more centralised offsetting scheme. While both 6.2 and 6.4 were primarily established in order to account for national targets, many voluntary carbon market participants see important implications for the VCM as well. This is because using offsets that are counted towards both a national and a corporate target is often viewed as a form of double-claiming.

International carbon offsetting standards and schemes are currently navigating a transition phase through assessing and developing guidelines and procedures to operate in parallel with Article 6.

Gold Standard is the leading standard in approaching Article 6

While Verra and Plan Vivo have indicated their intentions to align with Article 6, Gold Standard is the only shortlisted scheme that has implemented procedural changes in accordance with the new requirements set out in Article 6. These changes include:

- ▶ Revised double counting requirements to incorporate new procedures to manage carbon credits authorised for use under Article 6
- ▶ Introduced buffer requirements for non-carbon sequestration projects
- ▶ Provided clarification on justification requirements for retroactive projects;
- ▶ Implemented site visit requirements for validation and verification bodies
- ▶ Working definition for carbon removal project types

Fast followers: Verra and Plan Vivo

Verra and Plan Vivo have made high level statements around their commitments to align with Article 6, with Verra beginning to incorporate credits under Article 6 as part of its carbon unit labels.

CDM will be replaced by the new Article 6.4 mechanism, which allows some CDM projects to transition to the new mechanism under approved circumstances and rules. However, the transition of the CDM system to Article 6.4 is yet to be fully described.

The government of Japan is actively involved in implementing Article 6. The JCM has proposed new guidelines in line with Article 6.2; however, there is no information that suggests that Article 6.4 will be integrated into the JCM.

1. Executive summary

Operational performance across selected schemes

An analysis of the operational performance of the schemes was completed as part of the overall assessment. Looking into the details of what each scheme is delivering provides a useful narrative about what the application of the principles and governance is producing on the ground.

There are subjectivity complexities around the components in the operations performance layer, particularly around defining and assessing “what good looks like”. Hence, a qualitative approach was undertaken to perform a comparative analysis on the shortlisted schemes to understand both their ‘current state’ and historical performance.

The seven elements of operational performance analysed and key learnings from each are shown in Table 2 below. Given the subjective nature of these components, each scheme’s performance against these components should be reviewed in full within Section 4.

Table 2: Components of Operational Performance (1/2)

Component	What can we learn from it?	Key findings
Transparency and data availability	How accessible and comprehensive that data about the projects and credits are in practice	<ul style="list-style-type: none"> ▶ All five schemes provide data on projects and credits issued, but there are variations in how comprehensive and accessible the data is. ▶ For example, Verra, CDM and JCM make detailed project and credit data publicly available, while Gold Standard only provides detailed and downloadable data on the issued credits, not projects.
Carbon credit pricing	While higher priced credits aren't a robust marker of quality by themselves, they can help to show buyers' perceptions of their relative value	<ul style="list-style-type: none"> ▶ Credits issued by Gold Standard and Plan Vivo trade at a higher average price range than credits issued by others shortlisted standards. ▶ Gold Standard also has the largest range of prices (USD 4 - 47), while Plan Vivo has the smallest (USD 7-11)
Active credits and vintages	While vintage is not a direct measure of credit quality, older credits may warrant further investigation as to why they have not sold	<ul style="list-style-type: none"> ▶ All the reviewed schemes have an average annual vintage lower than 5 years except for CDM. ▶ Since the majority of active credits in CDM were issued before 2015, the vintage for most credits is over 6 years
Project type and methodology	Whether a broad or narrow range of project types have been accredited by the offset scheme	<ul style="list-style-type: none"> ▶ CDM has the most diverse mix of project types across a wide range of industries ▶ Verra, Plan Vivo, Gold Standard and JCM have a more focused range of project types

1. Executive summary

Table 2: Components of Operational Performance (2/2)

Component	What can we learn from it?	Key findings
Geographical diversity	Whether projects have been established in a broad or narrow range of different locations	<ul style="list-style-type: none">▶ Analysis of the issuance databases show that ~95% of credits are issued in developing countries, with▶ Asia accounting for the largest proportion of credits issued to date (71%)
Volume growth	Whether project numbers and credit issuance volumes are increasing over time	<ul style="list-style-type: none">▶ All schemes analysed had lower numbers of projects registered between 2016-21 compared with the period until 2015, except for Gold Standard▶ CDM has the largest volume of registered projects
Project rejection rates	How challenging that it might be to get a project through the scheme's application process	<ul style="list-style-type: none">▶ CDM's rejection rate appears much higher than Gold Standard▶ Verra did not publish statistics of rejections▶ JCM and Plan Vivo have a rejection rate of 0%, however this may be due to the low volume of projects registered

Joint Crediting Mechanism

While the JCM was included within the shortlist of offset schemes analysed, it proved to be challenging to apply the Assessment Framework to it in the same quantified manner that was carried out for other schemes. The JCM is a series of bilateral agreements between Japan and its partner countries, rather than the open and international design and governance of most offsetting programmes. The result is a strong relationship between the governance of the programme and its beneficiaries.

These relationships and how the scheme operates may be why the documentation required by JCM tended to be less detailed than what the other schemes required. Documentation supporting JCM's alignment to criteria such as testing for additionality was also limited. There may be internal processes between the Japanese government and partner countries which are not publicly available that contain this type of information.

The Assessment Framework reviewed markers of independence and documentation to support a wide range of offset principles. This made it difficult to score the JCM highly in these areas given the lack of publicly available information. The Assessment Framework might have been designed with a different set of emphasis if it had been focussed on partnership schemes like the JCM.

1. Executive summary

Key takeaways

Scrutiny over international carbon markets

- ▶ In light of the recent commitments by organisations and countries related to net zero targets, it is expected that the scrutiny over VCMs and international standards will grow
- ▶ Managing reputational risks will be crucial for the integrity of VCMs, which will require a robust set of principles and governance frameworks to ensure high quality carbon offsets. Some key risks include double counting, leakage, projects not being additional and permanence

Article 6

- ▶ VCMs and international standards are developing policies and procedures to align with Article 6
- ▶ Alignment with Article 6.2 and 6.4 will be key for determining the integrity of how carbon offsets are used and accounted for at both the corporate and national government level in the future
- ▶ Gold Standard has already put procedures in place for aligning with the requirements set out in Article 6
- ▶ Further support from governments and other parties are still required to test the operability and alignment with Article 6

Gold Standard and Verra were leading across the shortlisted schemes

- ▶ Gold Standard and Verra have demonstrated a strong performance across principles and governance frameworks as part of the Assessment Framework. Both schemes obtained the highest scores among the selected schemes, which reflects their ability to draw on the knowledge and experience gained from the history of VCM activity
- ▶ CDM has played an important foundational role in establishing VCM platforms. However, the assessment indicates that CDM is the scheme with the most opportunities for improvement, particularly in the governance frameworks. Article 6.4 is likely to address existing gaps through a centralised platform for offset project development
- ▶ Plan Vivo has the smallest geographical footprint of the schemes assessed, range of projects and volume of credit issuance. Plan Vivo's documentation requirements are less comprehensive in comparison to the requirements and controls that Gold Standard or Verra has in place

Introduction

High quality carbon credits are fundamental in the transition to a global net zero economy. The number of organisations committing to net zero targets tripled from 2020 to 2021 and more than 130 countries have set decarbonisation and net zero targets.

Demand for high-quality voluntary offsets is growing rapidly in Australia and around the world. This demand is being driven by the increasing number of companies, corporates, institutional investors and governments which are committing to net zero by 2050 and to interim emission reduction targets. Alongside this increase in volume demand is increasing scrutiny over the integrity of the underlying projects. A key issue at the core of offset use is what impact that Article 6 of the Paris Agreement will have on voluntary markets.

According to analysis by the United Nations Framework Convention on Climate Change ("UNFCCC") Secretariat, more than 130 countries have committed to ambitious decarbonisation and net zero targets. In addition, the number of companies and organisations that have committed to net zero targets tripled, to reach nearly 8,000, in 2021 alone. These expectations are also increasingly being factored into product and service delivery for consumers. The demands from consumers are a material driver of demand and a key factor in integrity considerations.

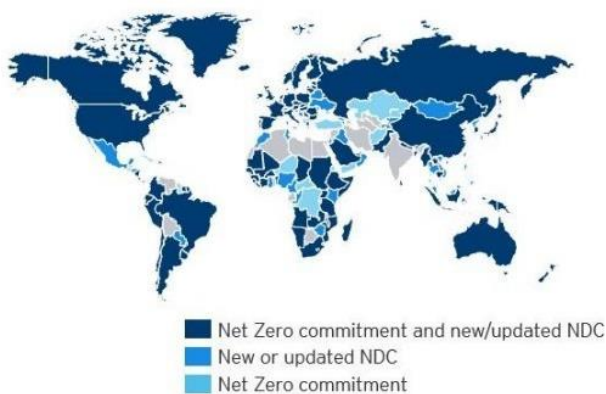


Figure 1: More than 130+ countries have committed to ambitious decarbonisation and net zero targets.

Source: UNFCCC, Energy and Climate Unit

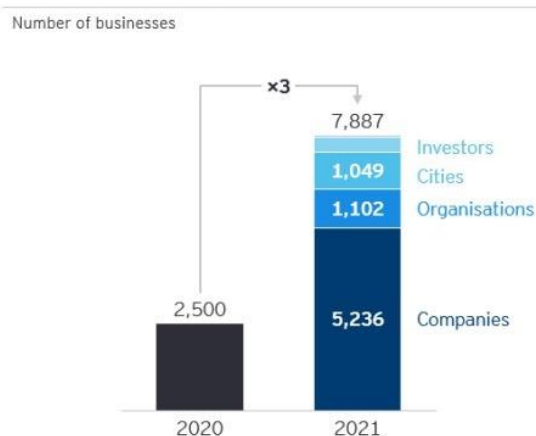


Figure 2: Commitments by companies and organisations to net zero are also continuing to accelerate

Source: UNFCCC, Energy and Climate Unit

3. Introduction

Carbon offsets also play an important role in enabling countries to meet their national emission reduction targets. Carbon offsets were an integral part of the framework created by the Kyoto Protocol and Article 6 of the Paris Agreement sets out a pathway for their use in the future as well. This means that offsets are not only under intense focus by private sector organisations, but also governments.

The high-level rulebook for Article 6 has only recently been agreed on at UNFCCC negotiations and the detailed work on implementation has only recently begun. While the application of Article 6 is in its early stages, it is likely that a wide range of countries will look to participate in this market on both the supply and demand sides.

With this exponential growth occurring in the market, the integrity of carbon units and the methodologies that define their credibility are experiencing increased scrutiny throughout the market. The history of carbon offsetting offers a number of lessons about the importance of paying careful attention to carbon offset quality. Whether they are used to meet corporate and/or national targets, the use of carbon offsets is likely to always attract careful scrutiny from both domestic and international media.

Climate Change Authority advice

Against this backdrop of rapid market growth, the Authority is conducting a review of the assessment principles for international offsets. This review is set in the context of the Paris Agreement and at the request of the Minister for Industry, Energy and Emissions Reduction, the Hon Angus Taylor MP.

The Authority's review will provide advice on the principles and criteria to:

- ▶ The use of international offsets under the Government's Climate Active program
- ▶ The development of the Indo-Pacific Carbon Offsets Scheme ("IPCOS") and
- ▶ Australia's accounting for its international climate change targets

This report

The work in this report has been designed to contribute to the development of the Authority's advice on international carbon market offsets. To inform the Authority's review of international offsets, this report presents:

- ▶ A stocktake of international offsets schemes and programs
- ▶ An Assessment Framework for examining and comparing the quality of offsets, and
- ▶ A comparative analysis of shortlisted offsets schemes and programs based on the Assessment Framework informed by the Assessment criteria, in addition to feedback from stakeholder consultations.

In putting its advice for the Government together, the Authority will need to combine the international perspective contained within this report together with the domestic Australian context. For instance, the Authority may be able to use the Assessment Framework and conclusions from the international review as context for considerations about Australia's domestic carbon offset project development framework - the Emission Reduction Fund (ERF). This report has not compared the ERF alongside the international schemes but a similar analysis framework could be used for it.

Approach

EY adopted a four-step approach for assessing the key elements that international carbon offset schemes have in place to demonstrate integrity and credibility. International schemes were assessed based on principles, governance frameworks and operational performance.

While there are carbon rating organisations analysing global standards, there is currently no formal or standardised approach to assessing the integrity of carbon offsets. There are a wide range of characteristics that can be considered when assessing the integrity dimensions of international offset schemes. Carbon offsets need to have strong climate mitigation credentials, avoid social, environmental and economic damage and deliver increased non-carbon benefits. To compare the performance of different international carbon offset schemes, EY built an Assessment Framework to review and assesses the key principles, governance and operational performance of a targeted list of international offset schemes. Figure 3 shows a four-step approach, which is discussed in detail in the following sections.

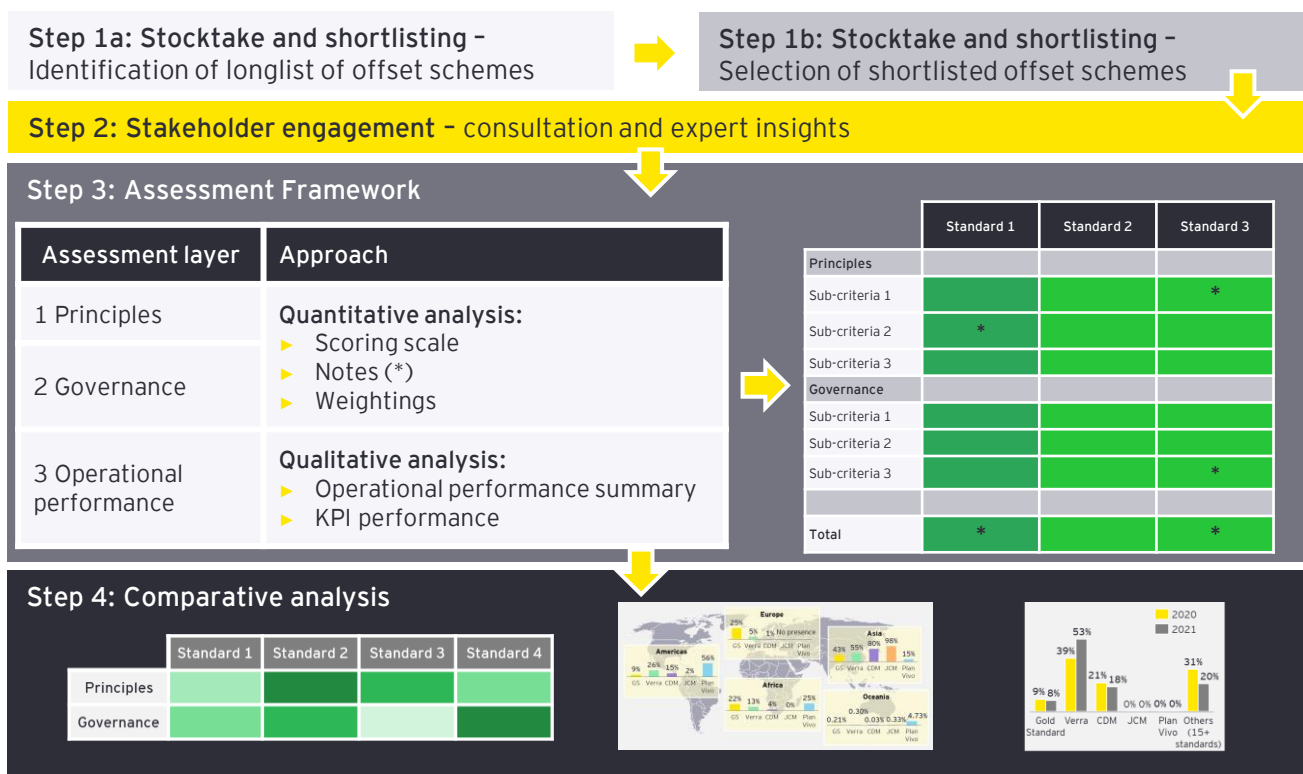


Figure 3: Integrity Assessment Framework for Carbon Offsets - Source : EY

3. Approach

Part 1: Stocktake and shortlisting

EY's first step included developing a short list of international schemes for deeper analysis. This involved identifying a long-list of schemes currently operating, which were subsequently screened to a shortlist of five offsetting schemes for a deep dive assessment.

The criteria for shortlisting included the footprint of projects, market share of credits issued, geographic relevance and the use of a balanced range of approaches. These parameters help to identify the diverse features that carbon offset schemes incorporate to reflect integrity, credibility and transparency. The longlist of schemes was:

- ▶ American Carbon Registry ("ACR")
- ▶ Regen Registry
- ▶ Climate Action Reserve ("CAR")
- ▶ Joint Implementation
- ▶ China GHG Voluntary Emission Reduction Program
- ▶ Emissions Reduction Fund ("ERF")
- ▶ UK Woodland Carbon Code
- ▶ Architecture for REDD+1 Transactions
- ▶ The REDD+ Environmental Excellence Standard
- ▶ Global Carbon Council ("GCC")
- ▶ Republic of Korea Offset Credit Mechanism

A variety of international schemes, including well regarded, established schemes (such as ACR and CAR) were longlisted. Some of these were ultimately excluded due to similarity with other schemes analysed. Other schemes were excluded due to immaturity and/or a low number of registered projects available for analysis. Allowances from within cap-and-trade markets were excluded as the Terms of Reference focuses on offsets. Appendix J provides descriptions of the long-listed schemes and further rationale for their exclusion.

The Australian Emission Reduction Fund's ("ERF") credit system (Australian Carbon Credit Unit) was considered for the analysis. The ERF is run by the Australian Government's Clean Energy Regulator and facilitates adoption of new practices and technologies to reduce their emissions. This is limited to within Australia only. It was noted that this would already be included within the wider assessment being conducted by the Authority. As such, it was felt that it was more valuable for the analysis to examine international standards through which insights may be drawn by the Authority when presenting their advice regarding the ERF system. Additionally, as the ERF scheme was within the longlist, the Authority may apply the Assessment Framework when considering the Australian carbon credit market.

The schemes shortlisted for analysis in conjunction with the Authority represent a wide array of different types of offsetting approaches. The final list aims to highlight what is possible and what is leading practice. The final shortlist includes Gold Standard, Verra, Plan Vivo, CDM and JCM. Table 3 summarises the schemes shortlisted and the rationale for their selection.

Due to fundamental differences in the operations of the JCM, EY adopted an alternative approach to provide insights on its principles, governance frameworks and operations performance. Key insights are discussed in the Analysis section.

3. Approach

Table 3: Shortlisted international offset schemes

Carbon offset scheme and description	Rationale for selection
<p>Gold Standard</p> <ul style="list-style-type: none"> ▶ A voluntary carbon offset program focused on progressing the United Nation’s Sustainable Development Goals (“SDGs”) and ensuring that project’s benefit their neighbouring communities ▶ Over 191 million carbon credits have been issued in over 98 countries 	<ul style="list-style-type: none"> ▶ Focus on lasting social, economic and environmental benefits ▶ Widely established methodologies and project certification programs ▶ Strong geographical presence ▶ The second most widely used voluntary offset program
<p>Verra</p> <ul style="list-style-type: none"> ▶ A carbon offset program developed and run by the non-profit Verra. It focuses on GHG reduction attributes ▶ There are VCS projects all over the world, employing various methodologies for GHG emission reductions and removals across various sectors ▶ Verra is the most widely used voluntary GHG program 	<ul style="list-style-type: none"> ▶ Well established methodologies and project certification programs ▶ Strong geographical presence ▶ The most widely used voluntary offset program
<p>Plan Vivo</p> <ul style="list-style-type: none"> ▶ Offset standard for forestry, agricultural, and other land-use projects ▶ Plan Vivo projects work closely with rural smallholders and communities ▶ The standard emphasises participatory design, ongoing stakeholder consultation, the use of native species, and biodiversity enhancement ▶ Focus on promoting sustainable development and improving rural livelihoods and ecosystem services 	<ul style="list-style-type: none"> ▶ A good example of an offset program that prioritises non-carbon benefits such as social impact, relieving poverty and protecting environments
<p>CDM</p> <ul style="list-style-type: none"> ▶ The CDM was set up under the 1997 Kyoto Protocol by the United Nations and shaped the current voluntary carbon market ▶ As the largest regulatory project-based mechanism, the CDM offers the public and private sector in high-income nations the opportunity to purchase carbon credits from offset projects in low or middle-income nations ▶ The CDM is a controversial scheme in that it has been widely criticised by for its quality and creating adverse effects as opposed to positive outcomes. ▶ The CDM will be superseded by Article 6.4 of the Paris Agreement, and is undergoing a major refit for this transition from Kyoto to Paris world. 	<ul style="list-style-type: none"> ▶ The official carbon offset scheme of the United Nations Framework Convention on Climate Change (“UNFCCC”) ▶ Strong geographical presence ▶ Helped to establish a global market for GHG emission reductions ▶ A good example of a scheme that may not be operating well despite its principles and governance
<p>JCM</p> <ul style="list-style-type: none"> ▶ The JCM is used by Japan and partner countries to exchange credits for decarbonisation technologies and projects ▶ Japan provides these technologies to partner countries to achieve GHG emission reductions and removals. Japan and the JCM partner countries can then use these to achieve their NDCs 	<ul style="list-style-type: none"> ▶ The JCM is not on a unified rulebook for offset project certification, providing a different perspective on carbon offset programs ▶ A significant contrast to all other schemes shortlisted in terms of methodology and operation ▶ Provides insights into how a bilateral offsetting programme could operate

Overall, it was determined that there is a wide range of different approaches are covered by the short list. Noting that principles and governance tends to have commonality throughout most schemes.

3. Approach

Part 2: Stakeholder consultation

To assist in the framework development and build upon engagement undertaken by the Authority, stakeholder consultations were conducted to seek feedback on the Assessment Framework and to gather experienced opinion and insight on developments with the potential to impact the future of VCM standards. Stakeholders were selected based on their expertise, exposure to VCM from an international and domestic perspective and their relevance to the scope of work. A full list of consultation undertaken is outlined in Appendix I.

The purpose of the stakeholder consultation meetings was to gain feedback on the intended approach being taken in assessing VCM standards. Being able to engage with interested stakeholders while in an early phase of the report allowed their input and knowledge to be considered when building in and formalising details. Areas that were highlighted as important to a number of stakeholders were allocated more attention in the report.

Discussing the potential interactions between Article 6 and VCMs going forward also offered valuable insight into where the VCM is expected to go in line with expectations. The stakeholders were also asked to add any additional insights as to emerging trends in the VCM which may pertain to this investigation and outcomes. Finally, the stakeholder consultations gave the groups a chance to bring up other noteworthy comments and ask questions.

The outcomes of this engagement were built into the analysis criteria examining aspects of integrity. Stakeholder engagement was key to shape considerations around which elements in the Framework analysis were considered fundamental to a scheme and informed their level of importance. Notable discussion points included the transparency on the credit tracking process, the vintage of credits allowed within a scheme, and the tension between robustness and agility of schemes.

Article 6

A key discussion point throughout the consultation process was the implications of Article 6 of the Paris Agreement and its interaction with VCMs. Stakeholders noted voluntary and compliance carbon markets are likely to have limited to no differentiation associated with guardrails and operations under Article 6. Therefore, it was called out as a key consideration for schemes to actively and openly pursue alignment with Article 6.

While Article 6 is expected to have an important impact on the future development of VCMs, this is still work in progress. International standards and schemes are currently assessing and developing their approach to operate in parallel with the guidelines set out in the Paris Agreement. The Analysis section provides further details on Article 6 and insights on how selected schemes are approaching these emerging guidelines for exchanging carbon credit units among countries.

Other key discussion points with selected stakeholders related to integrity in VCMs included a more stringent or conservative baseline, additionality testing requirements and the crediting cycle. This was incorporated into the Assessment Framework as a key sub-criteria. See the following discussion of the approach.

3. Approach

Part 3: Assessment Framework

Shortlisted carbon offset schemes were assessed based on a three-layer Assessment Framework consisting of:

1. Principles

2. Governance

3. Operations Performance

Each of these layers contains a set of criteria and sub-criteria. These were compiled from a literature review of research work conducted on offsetting standards. EY developed a bottom-up approach to estimate the scores at a sub-criteria level, which is then aggregated at a criteria and layer level. Part 4 within the Analysis section provides further detail on the scoring system.

Notes (*)

A “*note” approach was used to highlight important sub-criteria and to ensure that crucial details didn’t get subsumed within a higher overall criteria score. A *note response was triggered for a critical criteria if a scheme did not score highly enough on any one of its sub-criteria. For instance, the Principle consideration of leakage avoidance is a *note criteria as it is critical for a scheme to require leakage avoidance ensuring that carbon emissions are not simply shifted to other regions within the constraints of the scheme. If a scheme scores a zero on one of the selected sub-criteria, a “*note” would be raised in the final result even if all the other sub-criteria were met. This implies that it requires additional consideration and provides confidence that a failing of any aspect considered key for a scheme is clearly presented in the results.

Weighting

The Assessment Framework allows for the criteria and layers to be weighted according to relative importance. After conducting a sensitivity analysis over the assigned weightings, EY determined that equal weightings for criteria associated with the Principles and Governance layers was the most reasonable approach. The sensitivity analysis showed that uneven weightings had negligible implications to the overall weighted average results.

The only exceptions to the use of even weightings were for double-issuance, double-use, double-claiming, SDG alignment and non-carbon benefits. Double-issuance, double-use and double-claiming are all elements of double counting. As such, each of these sub-criteria were assigned a third of the weighting of a regular criteria so that double counting did not appear three times as important as other criteria. The same approach was applied to SDG alignment and non-carbon benefits, as these are both criteria that fall under benefits additional to emissions reductions. SDG alignment and non-carbon benefits were each assigned half the weighting of a regular criteria.

The weightings utilised are outlined in Appendix A.

3. Approach

1. Principles

Principles are a crucial component of each offsetting scheme’s structure as they define what the objectives of each scheme are. If the required principles aren’t present within a scheme it will be difficult for that scheme to deliver strong outcomes. This layer provides a numeric score for the principles of each offsetting standard.

Criteria considered under this layer include if the scheme has well-defined verification and eligibility protocols in place to mitigate risks of credit invalidity. Having standards in place such as safeguards against double-use, internal controls to protect against double-claiming/double-issuance, or requirements around transparency help confirm a scheme’s emissions are legitimate, quantifiable and traceable.

Non-carbon benefit considerations are examined in this layer. This is separated into environmental, economic and social non-carbon benefits. Non-carbon benefits are an increasingly key consideration for credit selection and the analysis describes the extent to which offsetting schemes focus on them.

This is a quantitative layer of the Assessment Framework. Therefore, the short-listed schemes are issued a score for compliance against each of the considered criteria in terms of whether the term has been well-defined and has appropriate protocols in place. This produces an analysis of schemes that have well-defined guidelines and procedures to minimise fraudulent credits and ensure the validity of real emission reductions.

The full list and descriptions of the principles and the specific *note criteria is set out in detail in Table 4 below.

Table 4: Principles Criteria (1/3)

	Criteria	*note	Description	What does good look like?
1	Double issuance	✓	Two offsets issued for the same tonne mitigated. This leads to double counting if more than one of these units is counted towards achieving climate change mitigation. This can occur, for instance, when the same project is registered under two different carbon programs or twice under the same carbon program.	<ul style="list-style-type: none"> ▶ Individually identifying carbon credits; ▶ Checking if project boundaries do not overlap; ▶ Ensuring offset credits are only issued after program approval of emission reduction verification reports; ▶ Actively monitoring project registrations included in other programs.
2	Double use	✓	One reduction or removal is claimed to compensate for two emissions by the same entity. For example, this would occur if an airline used the same unit to compensate for on-land emissions and in-flight emissions.	<ul style="list-style-type: none"> ▶ Requiring that the purpose of any offset credit retirement is clearly recorded in their registry systems - including on whose behalf the retirement was made.

3. Approach

Table 4: Principles Criteria (2/3)

	Criteria	*note	Description	What does good look like?
3	Double claiming	✓	One reduction or removal is claimed to compensate for two emissions by different entities. This would occur if an offset generator and buyer both claimed the abatement, or if the country hosting an offset project and another entity financing the project both claimed it. There are different opinions on whether double claiming always leads to a double counting problem.	<ul style="list-style-type: none"> ▶ Restricting the eligibility of project types; ▶ Requiring project developers to sign legal attestations asserting exclusive claims to any credited emission reductions.
4	Additionality	✓	"Not business as usual" principle: carbon credits should represent emission reductions or carbon dioxide removals that would not have been realised if not carbon credits.	<ul style="list-style-type: none"> ▶ Regulatory additionality; ▶ Financial additionality; ▶ Overcoming technological or institutional barriers; ▶ No-common practice additionality.
5	Permanence	✓	The carbon removed should not be reintroduced into the atmosphere in any capacity.	<ul style="list-style-type: none"> ▶ Setting a minimum permanence period; ▶ Requiring risk assessment and risks mitigation measures; ▶ Regular, ongoing monitoring, reporting and verification ("MRV") checks on permanence; ▶ Maintaining a buffer pool or insurance or equivalent mechanism.
6	Transparency	✓	Facilitating access to relevant non-confidential information, including that sufficiently detailed information on all projects is publicly available and program requirements are transparent.	<ul style="list-style-type: none"> ▶ Information publicly available on the standard's website: project certification requirements, project database, public consultation process; ▶ All relevant non-confidential project documentation be disclosed; ▶ Definition of a "confidential information".
7	Quantifiability	✓	Emission reduction must be calculated in a conservative and transparent manner, based on accurate measurements and quantification methods.	<ul style="list-style-type: none"> ▶ Requiring that emission reduction is real and measurable; ▶ Emission reduction verified by an accredited, third-party entity.
8	Baseline Setting	✓	The emissions level against which emission reductions or removals of a mitigation activity are determined. The business-as-usual scenario the mitigation activity is compared against. It runs the risk of being inflated to generate more credits.	<ul style="list-style-type: none"> ▶ Requiring to set a baseline on a conservative approach within the methodology approval procedure; ▶ Requiring that baseline determination includes: the impact of implemented and proposed government policies and legal requirements; technology improvements and energy transition over time; recalculating baseline on a regular, conservative timeframe.
9	Leakage avoidance	✓	Carbon leakage occurs as emissions are shifted to other regions with more relaxed emissions constraints. This can lead to an overall increase of global emissions.	<ul style="list-style-type: none"> ▶ Requiring leakage avoidance controls specified with clear, quantifiable assessment methods ▶ Requiring the ongoing publication of leakage monitoring and associated mitigation credit issuance for a project.

3. Approach

Table 4: Principles Criteria (3/3)

	Criteria	*note	Description	What does good look like?
10	Stakeholders inclusivity	✓	Stakeholders inclusivity means active engagement of the general public, including communities that might be affected by a project, into the methodology and project certification revision process. It should also allow for posting comments and complaints by the general public that have to be addressed by methodology/project proponent.	<ul style="list-style-type: none"> ▶ Methodology and project certification and update/renewal process is subject to public consultation; ▶ Actively performing outreach to gather public input; ▶ Requiring methodology/project proponents to address any comments/complaints raised during the public consultation process.
11	Legal compliance	✓	Project implementation is compliant with any applicable laws and regulations. Project ownership is clearly proven and undisputed.	<ul style="list-style-type: none"> ▶ Requiring submission of proof of compliance with applicable laws and regulations; ▶ Requiring project developer to submit a proof of project ownership.
12	Safeguards against negative impacts	✓	For a project to produce high-quality offset credits, it should not significantly contribute to social and environmental harms.	<ul style="list-style-type: none"> ▶ Applying a verification mechanism for safeguards against negative social, environmental and economic impacts of methodologies and projects under certification; ▶ Having a so-called "negative list", i.e. a list of projects that may cause negative environmental or social impacts and therefore cannot be certified.
13	SDG Alignment		The standard requires that non-carbon benefits associated with the carbon project are aligned to Sustainable Development Goals, including provision of evidence and reporting guidelines.	<ul style="list-style-type: none"> ▶ Requiring project proponents to identify whether and how the project is aligned with SDGs; ▶ Incorporating non-carbon benefits realisation into project assessment process; ▶ Publicly available information on SDGs alignment.
14	Non-carbon benefits		The standard require project proponents to deliver socio-economic or environmental non-carbon benefits in addition to carbon emission reductions that may not necessarily be aligned with SDGs.	<ul style="list-style-type: none"> ▶ Requiring project proponent to deliver social, environmental or economic non-carbon benefits; ▶ Reporting requirements and evidence on implementation of non-carbon benefits; ▶ Publicly available information related to the outcomes achieved; ▶ Assessment methodology to identify the realisation of expected non-carbon benefits; ▶ Verification processes

2. Governance

It is critical that offset schemes have effective governance systems over them if they are to deliver on the principles described in the previous layer of the Assessment Framework. The principles of an offset scheme can be comprehensive and robust but if they aren't effectively enforced or delivered then the offset credit quality might be poor. The governance layer provides a numeric score for the robustness of the mechanisms in place to ensure standardised, independent and transparent functioning of the scheme.

3. Approach

Criteria considered under this layer include the examination of governance bodies, including overarching frameworks, publicly available registries and transparency of key project indicators. Additionally, process-driven components were examined and alignment with Article 6. This includes examining alignment with specific criteria within Article 6.4, notably the crediting period and renewal requirements. As discussed in stakeholder consultations, this was a key component of the Assessment Framework Analysis and was highlighted as a *notes indicator.

This layer produces a quantitative assessment as all of its criteria are scored. The short-listed schemes are issued a score for compliance against each of the considered criteria in terms of whether adequate processes are in place and enforced. This produces an analysis of schemes that have an appropriately performing carbon credit system, ensuring the systems maintains integrity and credibility throughout performance. The internal workings of a scheme, such as its' corporate structure or level of stakeholder engagement in projects can provide key insights into a schemes maturity and presence in the voluntary carbon market.

The full list and descriptions of governance and the specific *notes criteria is in Table 5 on the following page.

Table 5: Governance Criteria (1/2)

	Criteria	*notes	Description	What does good look like?
1	Standard governance framework	✓	Assesses overall standard's robustness and credibility in three categories: standard's corporate framework, types of eligible projects and the credibility of standard's methodology and project certification process.	<ul style="list-style-type: none"> ▶ For corporate framework: whether standard's certification process is independent from any government or corporate oversight; ▶ For eligible projects: whether projects types allowed for certification do not pose any general controversies; ▶ For credibility of the certification process: i) whether a standard is rules-based or principles-based, and ii) whether a standard offers credits only for reduction claims, or also for commitment claims.
2	Methodology certification / modification	✓	Assesses the robustness and credibility of standard's methodology certification process.	<ul style="list-style-type: none"> ▶ This process should fulfill the following criteria defined in the principles sections: additionality, permanence, transparency, quantifiability, baseline setting, stakeholder's inclusivity, as well as environmental, social and economic safeguards and non-carbon benefits.
3	Crediting period		Set amount of time for which the owner of a certified offset project can obtain carbon credits. The length of a crediting period and any subsequent renewals should be aligned with a project type and potential changes to projects impact on emission reductions.	<ul style="list-style-type: none"> ▶ Dedicating different crediting periods to different project types based on project type qualities, ▶ Transparent renewal procedure for which an independent verifier is involved.
4	Project documentation requirements		Assesses the robustness and credibility of standard's project certification process.	<ul style="list-style-type: none"> ▶ Requiring project documents to check that it meets the following principle criteria: double-counting, additionality, transparency, permanence, legal compliance, safeguards against negative impact, non-carbon benefits.
5	Stakeholder engagement		Assess how stakeholders engagement is ensured throughout the methodology and project certification process.	<ul style="list-style-type: none"> ▶ Conducting a public consultation of proposed methodology/ project before its certification; ▶ Requiring a designated national authority to endorse a project before certification.

3. Approach

Table 5: Governance Criteria (2/2)

	Criteria	*note	Description	What does good look like?
6	Validation and verification body requirements	✓	Checks the credibility and independence of verification bodies from both the standard and methodology/project proponent as they assess whether a given methodology/project is compliant with the rules of a standard.	<ul style="list-style-type: none"> ▶ Ensuring independence of a VVB through setting applicable criteria for becoming a VVB and selecting a VVB for a given project; ▶ Ensuring VVBs have competencies needed to conduct validation and verification procedure.
7	Measurement Reporting and Verification Procedure	✓	Ensures that a project meets standard's principles throughout a crediting period.	<ul style="list-style-type: none"> ▶ Ensuring that MRV procedure allows for quantification of actual emission reductions and that any deviations or leaks are reported; ▶ Ensuring that the outcomes of MRV procedure are transparent; ▶ Ensuring that the frequency of MRV is aligned with a given project type; ▶ Requiring onsite project visits.
8	Complaints and appeal procedures		Ensures adequate complaints and appeals procedures are a part of methodology and project certification procedure.	<ul style="list-style-type: none"> ▶ Establishing procedures for receiving complaints and resolving disputes from any carbon crediting program stakeholders, including project/methodology proponents.
9	Credits trading procedure		Carbon credits are traded within registries. Standards cooperate with entities who own registries where carbon credits are stored. These entities are either subsidiaries, or entities with contractual arrangements. Each standard has a separate registry for its credits. Trading procedure within a given registry ensures no double counting occurs.	<ul style="list-style-type: none"> ▶ Ensuring unique identification of credit within the registry; ▶ Verification of entities that want to enroll in a registry ensuring identification of such entities; ▶ Transparent and publicly available rules for carbon credits ownership transfer.

3. Operational performance

This final layer looks at the projects and offset credits that are produced from each offset standard as the final layer in the Assessment Framework. Data on what projects are approved, where they are located, what technology they use and how quickly credits are retired can provide a useful overall narrative of what each scheme is doing. Trends in these data can help to describe how they have evolved and where they might be heading.

The assessments in this layer are often more subjective than those seen in the Principles and Governance layers because it can be more challenging to describe “what good looks like” at the project or credit level. For instance, an offset scheme that is growing fast and producing large volumes of credits might be doing so because it is well-run, well-regarded and therefore popular, or it could be producing large volumes of credits because it has lax principles and governance. It is therefore difficult to say conclusively that the best schemes are those that are growing at the fastest rates. But regardless of whether fast growth is viewed as a positive or negative characteristic, a high growth rate is an important characteristic of an offset scheme.

To reflect the different nature of the analysis in this layer, EY adopted a qualitative assessment approach, rather than the quantified scoring used in other sections. A qualitative approach provided a comparative analysis and offered insights into the acceptability and ‘current state’ of the selected schemes. Factors in this category included the scheme growth rate, the vintage of the units, carbon price and the geographical diversity of projects within the scheme.

3. Approach

The full list and descriptions of the operational performance criteria, including the identification of KPI criteria, is in Table 6 below.

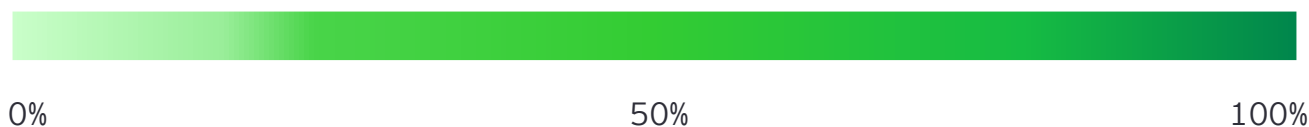
Table 6: Operational Performance Criteria

	Criteria	*note	KPI	Description	What does good look like?
1	Transparency and data availability	N/A	✓	▶ Accessibility to the list of projects and publicly available data	N/A
2	Carbon credit pricing		✓	▶ Average carbon credits price in 2021	
3	Active credits and vintage		✓	▶ Average time difference between a credit being issued and retired ▶ The number of credits generated by the standard that are yet to be retired and annual vintage	
4	Project type and methodology		✓	▶ Indicates the range of the accepted methodologies offered by the standard and outlines the approval process ▶ Indicates the share of avoidance and removal projects ▶ Standard certification for projects associated with expensive or novel technology	
5	Growth		✓	▶ Level of growth rate witnessed by the standard across credits issued and market share over the years	
6	Acceptability		✓	▶ Analysis of carbon certification methods and carbon pricing initiatives accept credits issued by the standard	
7	Regional and sector diversity		✓	▶ Indicates whether the projects/credits certified by standard are concentrated or geographically and sector-diverse ▶ Proportion of credits concentrated in developing countries	
8	Project issuance and retirement		✓	▶ Assessment undertaken for project certification and credit issuance ▶ Re-crediting periods ▶ Delays or rejections by the standard	
9	Presence of verification bodies		✓	▶ Measures the efficiency of the VVBs empanelment process and number of approved VVBs	

3. Approach

Part 4: Comparative analysis

The quantified portion of the analysis involved the rating of each scheme's criteria within each layer against a best-practice scoring system. These enables a further examination of 'what good looks like' with the application of the scoring rating scale:



The schemes were rated independently per a series of criteria across each layer. The scores out of 100% correspond to a shade of green as shown in the scale bar. The granularity of giving each sub-criteria a numeric value means each scheme received a percentage rating for all individual criteria. Each scheme received an overall score out of 100%.

*Note criteria was not given additional weighting to avoid skewing the results. This means a scheme may score highly for a section and still trigger a *note by not complying with one of the pre-determined criteria. This gave scope for comparative analysis across the schemes, with performance against *notes questions to be generated. This allowed for overview analysis of by individual criteria, by total scheme or in overall summary.

The qualitative KPIs were summarised in descriptive tables and included in Appendices C to G. Applicable conclusions and commentary was extracted to assist in comparing the key operational features and guide the Authority on which aspects may be fit-for-purpose in the final report. Key operational features include geographical distribution of credits issued, carbon offset pricing, vintage, methodologies and market share.

4 Analysis

EY analysis indicates that Verra and Gold Standard are the leading global carbon standards based on the assessment criteria associated with principles and governance frameworks.

The results of the Assessment Framework show the overall performance of each offset scheme against key integrity dimensions, which is shown in Table 7. Note that JCM was excluded from the quantitative assessment due to its different structure and operating model. Therefore, JCM could not be assessed in the same way as the other shortlisted schemes. The results shown in Table 7 should be reviewed alongside the operational performance detailed later in this section.

Table 7: Comparative analysis of shortlisted schemes against the Assessment Framework

Layer	Gold Standard		Verra		Plan Vivo		CDM	
	Score	*Note	Score	*Note	Score	*Note	Score	*Note
Principles	95%		87%		81%		74%	
Governance	88%		91%		70%	*	67%	*
Overall weighted average score	91%		89%		75%	*	70%	*

Key insights from the overall weighted average scores show that:

- ▶ Gold Standard and Verra are the leading international offset schemes for principles. Gold Standard is leading for principles on double issuance, transparency and safeguards against negative impacts. Verra is leading for principles in permanence and baseline setting. No *notes related to principles were identified for any of the schemes assessed.
- ▶ Plan Vivo and CDM could improve on principles by requiring projects to align with the UN SDGs. CDM could further improve by introducing safeguards against negative impacts.
- ▶ Gold Standard and Verra were the leading schemes for governance, with Gold Standard leading in measurement, reporting and verification (“MRV”) procedures and Verra leading in governance framework.
- ▶ Plan Vivo and CDM have notes to consider within the governance layer for governance framework. CDM also raised notes related to methodology certification / modification and MRV procedures. CDM could improve overall governance performance by introducing a complaint and appeal procedure as the other schemes have.

4. Analysis: Principles

Table 8 details the shortlisted scheme's performance against the Assessment Framework principles. None of the schemes noted further details that needed to be considered.

Table 8: Summary of quantitative principles analysis

#	Criteria	Gold Standard		Verra		Plan Vivo		CDM	
		Score	*Note	Score	*Note	Score	*Note	Score	*Note
1	Double issuance	100%		63%		88%		63%	
2	Double use	83%		83%		100%		67%	
3	Double claiming	92%		58%		75%		75%	
4	Additionality	94%		89%		72%		94%	
5	Permanence	94%		100%		81%		94%	
6	Transparency	100%		79%		71%		93%	
7	Quantifiability	100%		100%		100%		100%	
8	Baseline Setting	88%		100%		81%		88%	
9	Leakage avoidance	100%		100%		75%		100%	
10	Stakeholders inclusivity	83%		83%		83%		83%	
11	Legal compliance	100%		100%		100%		50%	
12	Safeguards against negative impacts / Do no harm principle	100%		50%		80%		20%	
13	SDG Alignment	100%		100%		17%		0%	
14	Non-carbon benefits	79%		79%		100%		43%	
Overall weighted average score		95%		87%		81%		74%	

Gold Standard obtained the highest overall weighted average score, followed by Verra and Plan Vivo

- ▶ Gold Standard is leading for principles in double issuance, transparency, leakage avoidance and safeguards against negative impacts. An example is transparency, where Gold Standard excels by requiring all projects to demonstrate financial additionality and ongoing financial need through a publicly available design document.
- ▶ All other schemes showed strong alignment to the principles outlined in the Assessment Framework but had areas for improvement. Plan Vivo and CDM do not have a requirement to align with the UN SDGs.
- ▶ Plan Vivo does have a leading performance around non-carbon benefits through a robust Project Logic that describes how project intervention will generate livelihood and ecosystem benefits relative to a baseline scenario.

4. Analysis: Principles

A detailed analysis of how the schemes compared for each criteria is summarised below.

Double issuance, double use and double claiming (double counting)

- ▶ Gold standard and Plan Vivo are the leading schemes for managing double counting, double use and double claiming. Gold Standard has robust internal and external controls in place to avoid double issuing such as using unique registry serial numbers and requiring projects to prove there is no double counting at both design and performance certification.
- ▶ Plan Vivo has set safeguards associated with credit retirement to minimise the risk of double use, including the use of a unique serial code to connecting certificates to the registry. Any user can view the details associated with a serial number in the registry.
- ▶ Gold Standard has the highest score for double claiming by requiring corresponding adjustment for certain uses of post-2020 VERs, including for use towards countries' NDCs and compliance obligations under CORSIA. This is supported by implementing new processes aiming to flag authorised credits and track the application of corresponding adjustment.
- ▶ Verra and CDM could be improved with more explicit definitions. Verra does not define double issuance, while CDM does not define the three elements of double counting separately and refers directly to double counting.

Additionality

- ▶ All schemes apply specific tools and assessment methodologies for demonstrating and assessing additionality. Gold Standard and CDM were leading for this principle, though Gold Standard bases its methodology on CDM's.
- ▶ CDM's main tool for assessing additionality has introduced a step involving identification of alternatives to the project activity consistent with current laws and regulations.
 - ▶ If the considered project activity is the only alternative amongst the ones reflected that is consistent with applicable laws of which there is general compliance, then the proposed CDM project activity is not additional.
- ▶ Plan Vivo could improve by having additional requirements for projects to not be common practice, as there was no mention of this as a requirement.

4. Analysis: Principles

Permanence

- ▶ Verra achieved a perfect score against permanence. Verra defines permanence well and requires projects to prepare a non-permanence risk report in accordance with the VCS Program Non-Permanence Risk Tool at both validation and verification.
 - ▶ The VCS Program requires projects to set aside non-tradable buffer credits to cover unforeseen losses in carbon stocks. The buffer credits from all projects are held in a single pooled buffer account, which can be drawn upon in the event of a reversal in carbon stocks in any individual project.
- ▶ All schemes maintained buffer pools, insurance or equivalent mechanisms in place to manage the risk of emissions reductions being reversed. All schemes also require compensation of identified reversals and set minimum permanence periods.
- ▶ Plan Vivo could improve by having more robust controls such as Verra's non-permanence risk tool and by requiring stricter MRV checks.

Transparency

- ▶ All schemes had clear definitions regarding transparency and allowed public access to project databases.
- ▶ Gold Standard achieved a perfect score and differed from other schemes by having stricter requirements on the information that must be published to users and by explicitly defining what can be considered confidential.
 - ▶ All Gold Standard projects are required to demonstrate Financial Additionality and demonstrate Ongoing Financial Need. The project proponents have to provide an overview of project finances that demonstrates how the finance derived Gold Standard Certification is material to the ongoing sustainability of the Project.
 - ▶ All project documentation, except confidential information must also be made publicly available through the Impact Registry.
- ▶ Verra and Plan Vivo could both improve by defining what information would be considered confidential and therefore not necessary to disclose, as this is explicitly defined by Gold Standard.

Quantifiability

- ▶ All schemes achieved perfect scores related to quantifiability. All schemes defined quantifiability, checked that emissions reductions were real and measurable and required some form of assurance from a third party verifier. All schemes required project boundaries, sources and greenhouse gases ("GHGs") in numerical values.

4. Analysis: Principles

Baseline Setting

- ▶ All schemes defined a baseline setting methodology that specified how the baseline should be generated, assured and updated.
- ▶ Verra was the leading scheme and achieved a perfect score. Verra's requirements for a baseline include:
 - ▶ The identified GHG sources, sinks and reservoirs.
 - ▶ Existing and alternative project types, activities and technologies providing equivalent type, and level of activity of products or services to the project.
 - ▶ Data availability, reliability and limitations.
 - ▶ Other relevant information concerning present or future conditions, such as legislative, technical, economic, socio-cultural, environmental, geographic, site-specific and temporal assumptions or projections.
- ▶ Verra differed from the other schemes in that it required baseline updating to account for any technology improvements and energy transitions; a clause that other schemes did not require.
- ▶ Plan Vivo could improve by not allowing exceptions to adjust the baseline. If the baseline is a continuation of current land use without any assumption of change in land cover, updating of the baseline is not required.

Leakage avoidance

- ▶ All schemes performed well against leakage avoidance, with Gold Standard, Verra and CDM all achieving perfect scores. These schemes explicitly define leakage and require calculation of leakage emissions. Leakage estimates must be published and recalculated for. Gold Standard provides project-specific equations for calculating leakage and requires projects to use these to provide regular reports for publishing leakage estimates.
- ▶ Plan Vivo also implements these measures but could improve by publishing leakage estimates online as there is currently no need to present this data as other schemes require.

Stakeholders inclusivity

- ▶ All schemes performed well against stakeholders inclusivity and achieved the same score of 83%. All schemes required stakeholder consultation as part of project certification, however Plan Vivo's requirements were not specific. Plan Vivo projects must provide evidence that stakeholders have been informed of the project and provided technical details. There was no mention of stakeholder consultation requirements during methodology certification.
- ▶ All other schemes could improve by involving increasing public consultation.

4. Analysis: Principles

Legal compliance

- ▶ Gold Standard, Verra and Plan Vivo achieved perfect scores against legal compliance. All three schemes required compliance with all applicable laws and regulations and had controls in place to check for compliance. These schemes also set criteria for verifying the ownership of a project.
- ▶ According to Gold Standard, projects shall be in compliance with the applicable host country's legal, environmental, ecological and social regulations. Information about legal ownership and legal rights is included in the Project Design Document which is verified by the project verifier.
- ▶ CDM is developing, and could improve, by implementing a system for controlling and assuring legal compliance as the three other schemes have. CDM has also not implemented a direct system to verify that the project proponent actually has exclusive ownership.

Safeguards against negative impacts / 'Do no harm' principle

- ▶ Gold Standard and Plan Vivo were the leading schemes for preventing negative impacts and harm, with Gold Standard achieving a perfect score in this assessment.
- ▶ Gold Standard implements safeguards against a range of social, environmental and economic impacts and has a list of projects which cannot be certified, such as nuclear energy and fossil fuel projects. All Gold Standard projects have to conduct a Safeguarding Principles Assessment.
- ▶ Verra and Plan Vivo have similar safeguards in place but do not provide a list of projects to be excluded.
- ▶ CDM is developing in that it requires an environmental impact analysis but does not define this principle as a requirement and as such does not apply any safeguards.

SDG Alignment

- ▶ Gold Standard and Verra were the leading schemes for SDG alignment, achieving perfect scores. Both schemes required projects to align to at least three SDGs and required reporting to verification to evidence this alignment.
- ▶ Plan Vivo is developing as it only encourages alignment with the SDGs. No other reporting or assurance is therefore required.
- ▶ CDM achieved a score of 0% as it does not have any requirements related to SDGs.

4. Analysis: Principles

Non-carbon benefits

- ▶ Gold Standard, Verra and Plan Vivo performed well against non-carbon benefits, with Plan Vivo achieving a perfect score.
- ▶ Plan Vivo requires all projects to evidence related environmental, economic and social non-carbon benefits. Plan Vivo then requires publicly available reporting on these benefits, which can must then be verified.
 - ▶ Projects must have a robust Project Logic that describes how the Project Intervention(s) will generate Carbon, Livelihood and Ecosystem Benefits relative to the Baseline Scenario.
 - ▶ Livelihood and ecosystem Indicators must be monitored for all projects to assess any impact from a Plan Vivo project.
- ▶ Both Gold Standard and Verra have similar requirements but do not require alignment with the environmental, economic and social SDGs specifically.
- ▶ CDM is developing in that it has no requirements to align to any SDGs, nor does it require any benefits related to environmental, economic or social benefits. CDM does have a sustainable development tool that allows project developers to showcase non-carbon benefits and could improve by making these benefits mandatory.

4. Analysis: Governance

The results of the analysis of scheme governance is presented in Table 9 below, which summarises the key governance criteria for the selected schemes. The table sets out the spread of scores for each criteria across the selected schemes, including the *notes linked to key criteria.

Table 9: Summary of quantitative governance analysis

#	Criteria	Gold Standard		Verra		Plan Vivo		CDM	
		Score	*Note	Score	*Note	Score	*Note	Score	*Note
1	Standard governance framework	80%		100%		50%	*	60%	*
2	Methodology certification / modification	100%		100%		100%		67%	*
3	Crediting period	100%		100%		75%		100%	
4	Project documentation requirements	100%		100%		67%		83%	
5	Stakeholder engagement	63%		75%		50%		75%	
6	Validation and verification body requirements	100%		100%		88%		88%	
7	Measurement, Reporting and Verification Procedure	100%		90%		80%		60%	*
8	Complaint and appeal procedure	100%		100%		67%		0%	
9	Credits trading procedure	50%		50%		50%		67%	
	Overall weighted average score	88%		91%		70%	*	67%	*

Based on the overall weighted scores, Verra and Gold Standard were the leading international offset schemes for governance

- ▶ Verra and Gold Standard show consistently high performance results in almost all criteria. This is due to them being rule-based standards with clear policies and thorough procedures in place, as well as having ample supporting evidence available online.
- ▶ Both Gold Standard and Verra produced mid-range scores in the stakeholder engagement and credit trading procedure criteria.
 - ▶ Relating to stakeholder engagement, neither scheme had strong guidance on how a designated national authority would review projects.
- ▶ Plan Vivo and CDM showed strong alignment with a number of criteria, however had some areas for improvement, including:
 - ▶ Both Plan Vivo and CDM could look to provide more clear information online as both schemes scores are negatively affected due to lack of complete information
 - ▶ CDM currently does not have a complaint and appeal procedure incorporated into their certification processes

4. Analysis: Governance

Standard governance framework

- ▶ Verra attained a perfect score under this criteria for fulfilling all aspects of establishing a sound governance framework.
- ▶ Gold Standard also produced a high result, however has fewer comprehensive policies and controls in place than Verra which inhibited them from scoring higher.
- ▶ Plan Vivo and CDM raised a *note for not publishing an internal conflict of interest policy, risking the independence of their board and employees.
- ▶ Plan Vivo also allows for a controversial procedure of crediting commitment claims to reduce emissions as opposed to actual emission reductions. This results in some projects receiving certificates ahead of climate benefits being achieved.

Methodology certification / modification

- ▶ Gold Standard, Verra and Plan Vivo all produced perfect scores under this criteria by having comprehensive methodology certification/modification requirements, mandatorily involving independent verifiers in methodology reviews and including a public consultation review processes.
- ▶ CDM raised a *note in this criteria by not using independent verifiers in their methodology review process, as certification is achieved using panels and working groups within CDM's corporate structuring.

Crediting period

- ▶ Gold Standard, Verra and CDM produced perfect scores under this criteria as they have transparent rules, set baseline review processes, involvement of independent verifiers in the renewal process and provide different crediting periods based on project type.
- ▶ Plan Vivo does not provide any information pertaining to independent verifiers involvement in the renewal process however performs well under all other sub-criteria.

Project documentation requirements

- ▶ All standards have description documents that allow for the determination of project boundaries.
- ▶ Gold Standard, Verra and CDM all publish document templates online to make comparing the information provided by various entities easier. Plan Vivo only publishes templates for the Project Idea Note and the Project Design Document.
- ▶ Gold Standard and Verra differ to the other two schemes as they both require all document types (description, legal ownership, validation, non-permanence, and safeguards) be submitted for a project, whereas CDM and Plan Vivo require fewer.

4. Analysis: Governance

Stakeholder engagement

- ▶ All schemes achieved similar scores for stakeholder engagement. All schemes performed highly in regard to active engagement (organising and performing adequate stakeholder consultations) and methodology review procedures (disclosing methodology for public consultation to inform design).
- ▶ CDM was the only standard to require a designated national authority endorsement.
- ▶ Verra was the only standard that had a robust project review consultation period (Gold Standard does have a project review process but it is not as in depth as Verra).

Validation and verification body requirements

- ▶ All schemes performed very highly in this regard, with Gold Standard and Verra producing perfect scores.
- ▶ All schemes had selection criteria that allows the scheme to check VVB's expertise in a field of verified methodology or project and all schemes require the VVB to visit project sites.
- ▶ To attain perfect scores, CDM would need to ensure VVB independence for future projects and Plan Vivo would need to provide indicative fee structures online.

Measurement reporting and verification procedures

- ▶ Gold Standard achieved a perfect score for this procedure and Verra performed highly (90%). The difference between the two schemes results from Gold Standard having a digital MRV solution implemented, whereas Verra is in an innovation/ uptake time phase of DMRV platforms.
- ▶ CDM scored mid-range for this criteria and raised a *note due to not requiring all projects to meet permanence checks. CDM only requires permanence checks in the case of afforestation or reforestation projects.

Complaint and appeal procedure

- ▶ Gold Standard and Verra both scored perfectly in this criteria due to there being robust complaints and appeals procedures incorporated in their certification processes.
- ▶ CDM does not currently have a complaint and appeal procedure in place which resulted in a score of 0%.
- ▶ Plan Vivo scored in the mid-range, which is attributed to their having a complaint procedure incorporated into the certification process however not an appeals procedure.

Credits trading procedure

- ▶ All standards underperformed in the credits trading procedure criteria, this being mainly due to lack of information available.
- ▶ CDM scored the highest for this criteria due to having information regarding the procedure of credit ownership transfer, whereby the other schemes either have very limited or no information pertaining to this.

4. Analysis: Governance

Article 6

As discussed earlier, international standards are going through a transition phase where further guidelines associated with international carbon credit trading are required in line with Article 6 set out in the Paris Agreement.

Why Article 6 is important

Article 6 was adopted within the Paris Agreement in 2015, but it took until COP26 at Glasgow in 2021 for its rulebook to be agreed, which precluded its practical use. Carbon credit market development activities under Article 6 are intended to ensure that countries can cooperate to direct funds towards activities that will reduce greenhouse gas emissions and then count these outcomes towards another country's target. To achieve its objectives, Article 6 introduces the two main mechanisms which are set out in Article 6.2 and 6.4 respectively.

Article 6.2

Under Article 6.2, countries can trade emission reductions between themselves to fulfill their Nationally Determined Contributions ("NDCs"). For this purpose, they must conclude bilateral or multilateral agreements. The units used in these transactions are called Internationally Transferred Mitigation Outcomes ("ITMOs"). When trading ITMOs, the country where the reductions are achieved are required to apply 'corresponding adjustments'. This means that emissions reductions represented by ITMOs transferred to another country must be deducted from the NDC of the country where ITMOs originated from. The purpose of the corresponding adjustments are to avoid double-claiming the reductions/removals achieved.

Article 6.4

Article 6.4 is a successor to the CDM by establishing an international system for offset project development. Provisions of Article 6.4 establish a United Nations Supervisory Body that administers a global carbon credit market. Under this mechanism, project developers will be able to register their projects. In order to do so, they will have to obtain permission from the authorities of the country hosting the project and from the UN Supervisory Body. After passing the certification process, the project proponent will receive carbon credits, called A6.4ER. Credits issued under the Article 6.4 mechanism may be purchased by corporations, states, and individuals. In order for the A6.4ER trading system to start, the UN Supervisory Body must prepare relevant regulations and establish a trading platform.

A6.4ER credits will be considered ITMOs when they will be authorised for use towards fulfilment of NDCs and/or mandated for use for other international mitigation purposes.

4. Analysis: Governance

Gold Standard is the leading standard in approaching Article 6.

Gold Standard is the early adopter among the selected schemes by aligning its operations with new requirements of Article 6 reached at COP26. Gold Standard has implemented procedural changes dedicated to Article 6 such as:

- ▶ Revised double counting requirements to incorporate new procedures to manage carbon credits authorised for use under Article 6;
- ▶ Introduced buffer requirements for non-carbon sequestration projects;
- ▶ Provided clarification on justification requirements for retroactive projects;
- ▶ Implemented site visit requirements for validation and verification bodies;
- ▶ Working definition for carbon removal project types.

Additionally, Gold Standard has developed an Article 6 Authorisation Checklist and started implementing actions such as :

- ▶ Updating its crediting periods and renewals
- ▶ Updating its rules and requirements
- ▶ Engaging with key stakeholders from several national governments
- ▶ Organising webinars and providing online guidance.

Credits that meet the additional requirements will be marked on the Gold Standard Impact Registry as authorised by the Host Party for use as ITMOs. Moreover, Gold Standard will conduct a pilot program targeting project developers whereby selected entities will receive technical assistance in dealing with national governments on Article 6 authorisations. In Q3 2022, Gold Standard plans to publish key findings and recommendations to inform Article 6 preparations.

Fast followers: Verra and Plan Vivo

Verra and Plan Vivo have made high level statements around their commitments to align with Article 6. Unlike Plan Vivo, Verra has begun incorporating credits under Article 6 as part of its carbon unit labels. No other information was available for either scheme.

Improvement opportunities for CDM and JCM regarding their alignment with Article 6

CDM will be replaced by a new Article 6.4 mechanism. CDM projects can transition to the new mechanism, if it is approved by the country where the project is located, and if the project meets Article 6.4 rules. For methodologies, CDM projects can use their CDM methodologies until 31 December 2025 or the end of their current crediting period, whichever comes first. The transition of the CDM system to Article 6 is yet to be fully described hence it is difficult at this stage to assess how much progress it will make.

The JCM has proposed new guidelines in line with Article 6.2 and already cooperates with its partnering countries. The government of Japan is actively involved in implementing Article 6 and has held an International Conference to discuss the transition. However, at this stage the JCM has not sought to integrate the Article 6.4 provisions into the operation of the JCM.

4. Analysis: Operational Performance

An analysis of the operational performance of the schemes was completed as part of the overall assessment. Looking into the details of what each scheme is delivering provides a useful narrative about what the application of the principles and governance is producing on the ground.

As described earlier, the assessments in this layer are more subjective as it can be more challenging to describe “what good looks like” at the project or credit level. Hence, a qualitative approach is undertaken to perform a comparative analysis on the shortlisted schemes to understand both their ‘current state’ and historical performance.

The seven elements of operational performance analysed and key learnings from each are shown in Table 10 below.

Table 10: Elements of Operational Performance

Operational Performance Component	What can we learn from it?
Transparency and data availability	How accessible and comprehensive that data about the projects and credits are in practice
Carbon credit pricing	While higher priced credits aren't a robust marker of quality by themselves, they can help to show buyers' perceptions of their relative value
Active credits and vintages	While vintage is not a direct measure of credit quality, older credits may warrant further investigation as to why they have not sold
Project type and methodology	Whether a broad or narrow range of project types have been accredited by the offset scheme
Geographical diversity	Whether projects have been established in a broad or narrow range of different locations
Volume growth	Whether project numbers and credit issuance volumes are increasing over time
Project rejection rates	How challenging that it might be to get a project through the scheme's application process

4. Analysis: Operational Performance

Transparency and data availability

All five reviewed schemes provide data in terms of projects and credits issued to maintain transparency. Based on the evaluation of publicly available data, CDM, Verra and JCM provide both projects and credits data in downloadable format.

- ▶ Gold Standard publishes detailed credits data in a downloadable format. However, project data cannot be downloaded for further analysis.
- ▶ Plan Vivo provides both project and credit level data, however, it is not available to be downloaded for detailed analysis.
- ▶ While JCM provides data in downloadable format, fewer details are available about the type of projects / credits issued, thereby limiting the analysis.

Carbon credit pricing

Credits issued by Gold Standard and Plan Vivo trade at a higher average price range (USD7 to USD15) than credits issued by others shortlisted standards. For Gold Standard, project price range varies between USD4 to USD47, with majority of the project priced between USD10 to USD15. Similarly for Plan Vivo, the price ranges between USD 7-11; selling on average for USD 8.5 (2020).

Figure 4 shows the price band (2016-21) for projects issued by shortlisted schemes.

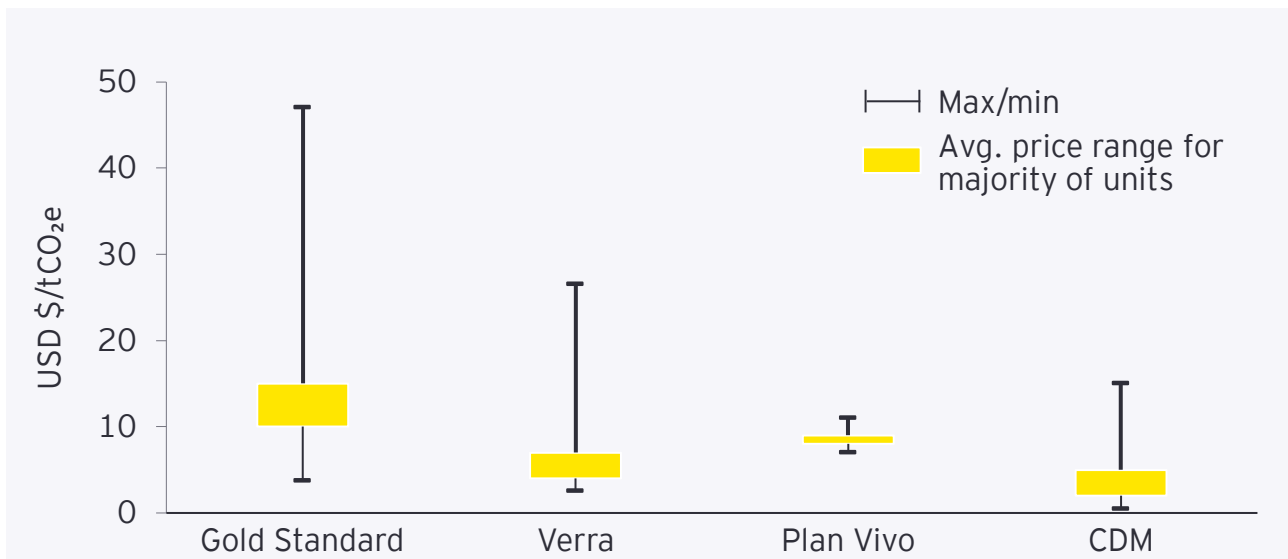


Figure 4: Price range (USD) per tonne of CO₂ equivalent (2016-21)

4. Analysis: Operational Performance

Active credits and Vintage

Analysing the vintage of credits as they are retired highlights important differences between the offset schemes, with CDM a notable outlier in having the portfolio of active units with the oldest average age.

The average time duration between a credit issued and retired is under 2 years for Gold Standard and Verra. This duration varies between different types of projects. E.g. for Gold Standard, the duration ranges from 319 days for solar thermal electricity projects to 1,223 days for geothermal projects. For Verra, it ranges from 217 days for energy industry projects up to 2,900 days for fugitive emissions projects.

For CDM, while detailed information on retirement is not available, the duration between issuance and retirement is as high as 10 years for fixed crediting period and 7 years for renewable crediting period projects.

Analysis of vintage data shows that all the reviewed schemes have an average annual vintage lower than 5 years except for CDM. Since the majority of active credits in CDM were issued before 2015, the vintage for most of the credits is greater than 6 years. Further, Plan Vivo and JCM have majority of the active credits with vintage in last 0-3 years. Figure 5 details the split of active credits with their vintage.

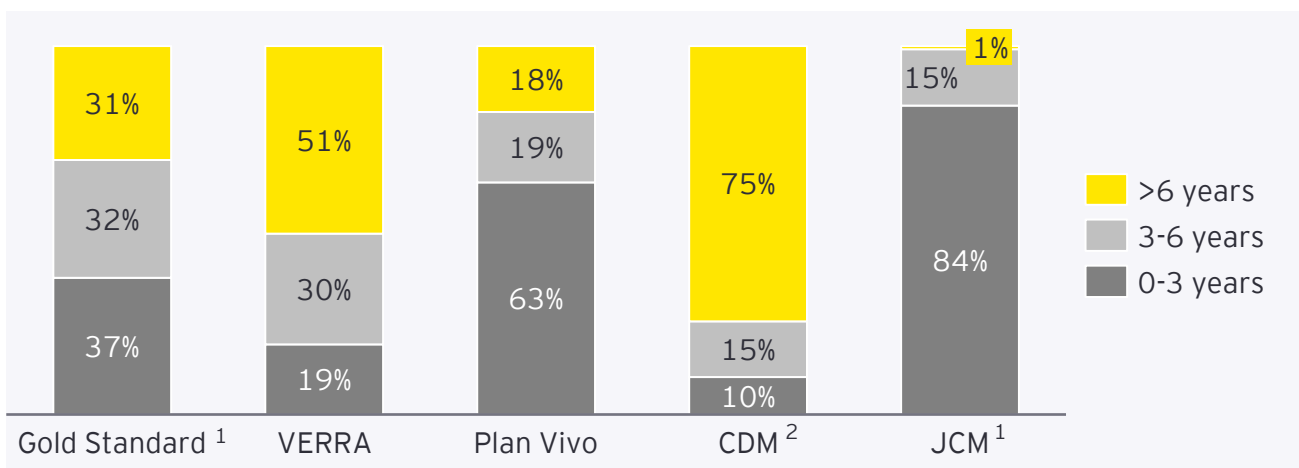


Figure 5: Annual vintage of active credits issued under shortlisted schemes

Internal controls around additionality are key for transparency and adequate operational performance

The literature review suggests that the lack of proper enforcement by CDM on additionality testing, quantification and baseline setting may have resulted in lower prices and higher vintage.³

1. Gold Standard and JCM also issues ex-ante credit with future vintage. While Gold standard has 1.5% of overall active credits with vintage year greater than or equal to 2022, JCM has 45.5% of credits with future vintages

2. In case of CDM, retired credits data is not available and hence 'voluntary cancelled' credits have been used as a proxy for retired credits

3. Source: How additional is the Clean Development Mechanism, Öko-Institut, Stockholm Environment Institute and INFRAS

4. Analysis: Operational Performance

Project type and methodology

CDM has the most diverse mix of project types and has developed close to 30 project methodologies across a wide range of industries, including cement, power, agriculture and construction. Project types include:

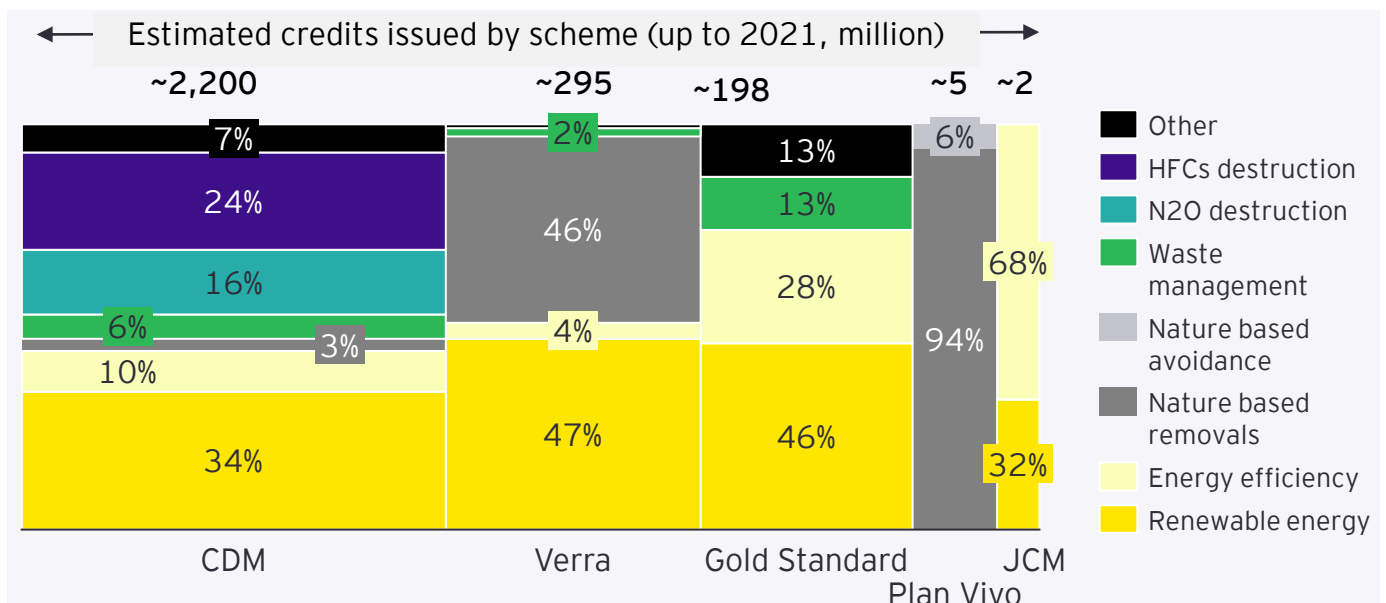
- ▶ Hydrofluorocarbon (“HFC”) focused projects
- ▶ N₂O destruction project
- ▶ Renewable energy and energy efficiency

Verra, Plan Vivo, Gold Standard and JCM have a more focused range of project types:

- ▶ The majority of credits issued by Verra, Gold Standard and JCM (70 - 80%) are related to only 5 - 10 project types, including energy efficiency, renewable energy and agriculture and forestry.
- ▶ 99% of credits issued by JCM are focused on energy efficiency and renewable energy.
- ▶ 90% of credits issued by Verra are focused on the project types labelled Agriculture Forestry & Other Land Use and Energy industries
- ▶ Plan Vivo focuses on land based removal projects and hence offer a limited number of project types, primarily forestry related.

Figure 6 details out the total credits issued by various shortlisted schemes till 2021.

Figure 6: Credits issued across project types



CDM, Gold Standard and JCM are dominated by avoidance projects, whereas projects registered under Plan Vivo are predominantly focused on removals. On the other hand, Verra has a fair mix of both avoidance and removal projects.

Projects with novel technology: Only a few schemes such as Verra (0.1% of total credits) and CDM (0.1% of total credits) list some projects using methodologies that involve novel or expensive technologies such as Carbon Capture and Storage (CCS), Direct Air Capture⁴ and Hydrogen Peroxide-based Propylene Oxide (HPPO) technology.

4. Direct Air Capture (“DAC”) methodologies have been approved, however there are no existing projects registered based on DAC

4. Analysis: Operational Performance

Geographical diversity

Analysis of the issuance databases show that ~95% of credits are issued in developing countries. Asia accounts for the largest proportion of credits issued to date (71%) followed by South America (16%) and Africa (8%). Oceania has the lowest share (0.1%) and is mostly accounted for by Plan Vivo credits issued in Fiji, Solomon Islands, NZ and Vanuatu.

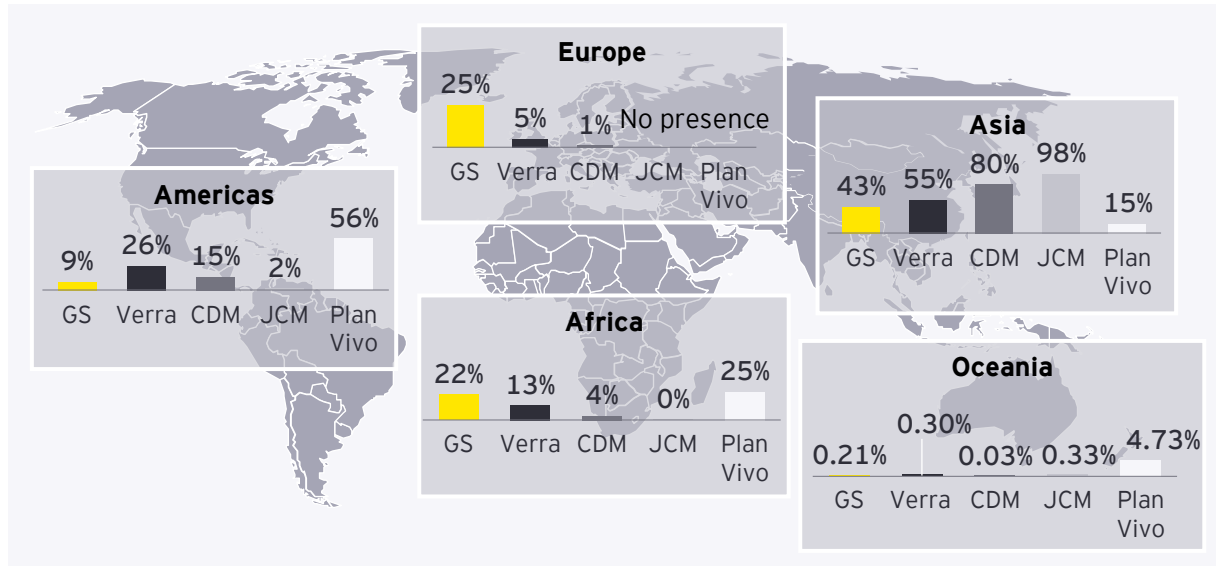


Figure 7: Regional diversity (Distribution based on total credits issued to date)¹

More than 90% of Gold Standard’s credits issued come from projects in Europe, Africa and Asia. Verra’s credits are mainly based on projects in Asia, Africa and Americas with only 5% of its volume from Europe. CDM and JCM are highly concentrated in Asia. The concentration of JCM in Asia is a natural consequence of the focus of the Japanese government in this region.

Sectoral diversity

Table 11 shows that the most common sectors for carbon credits are renewable energy and energy efficiency and forestry. Most schemes offer credits in more than six sectors, except JCM and Plan Vivo which both only issue in two.

Table 11: Sectoral diversity across reviewed schemes⁵

	Gold Standard	Verra	CDM	JCM	Plan Vivo
Agriculture	✓	✓			
CCS/ CCU			✓		
Renewable Energy and Energy efficiency	✓	✓	✓	✓	
Forestry	✓	✓	✓		✓
Fuel switch	✓	✓	✓		
Fugitive Emission	✓	✓	✓		
Manufacturing and Industrial gasses		✓	✓		
Other land use					✓
Transport		✓	✓	✓	
Waste	✓	✓	✓		

5. Source: EY Analysis, World Bank, Gold Standard, Verra, UNFCCC, JCM and Plan Vivo

4. Analysis: Operational Performance

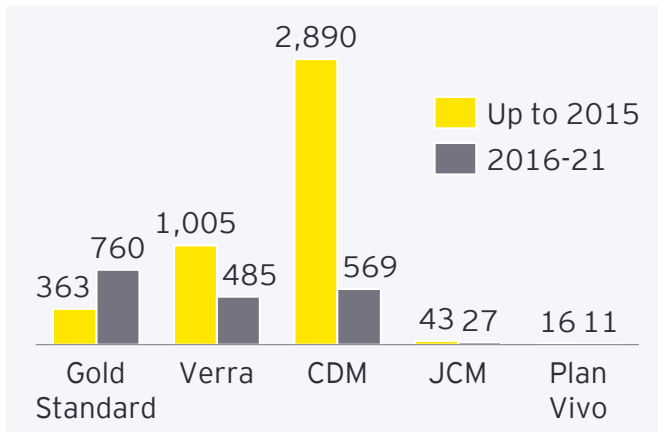


Figure 8: Total projects registered

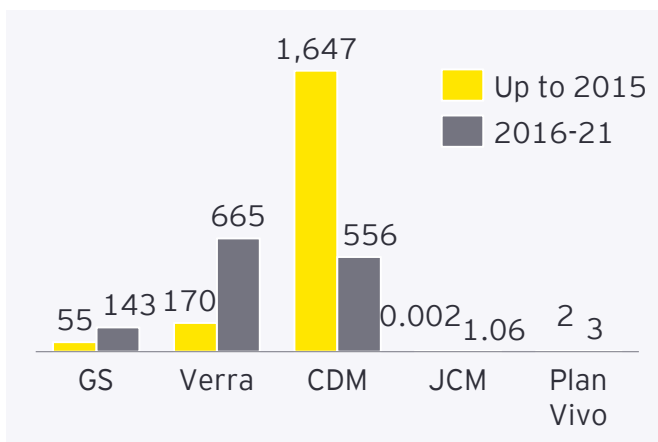


Figure 9: Carbon credits issued (MtCO_{2e})

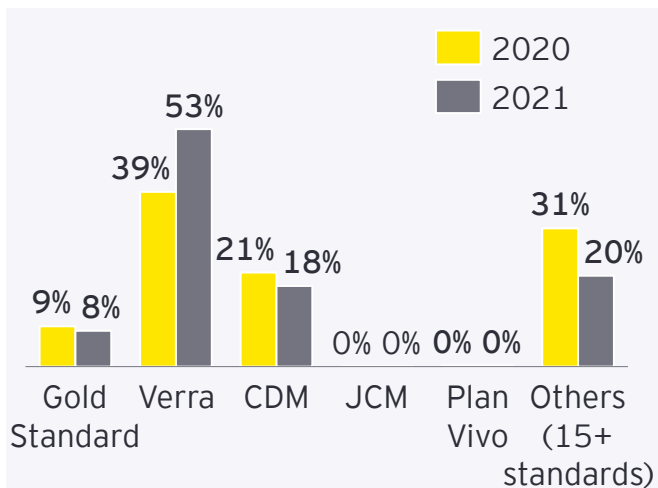


Figure 10: Market share based on credits issued⁶

Volume growth

All schemes analysed had lower numbers of projects registered between 2016-21 compared with the period until 2015, except for Gold Standard (Figure 8). While Verra had a reduction in total project registered (Figure 9) the amount of carbon credits issued rose considerably, notably credits issued by Verra increased more than 100% from 140 MtCO_{2e} in 2020 to 295 MtCO_{2e} in 2021.

CDM has the largest volume of registered projects, mostly owing to its early dominance under the Kyoto Protocol compliance market, however, its growth in recent years has slowed. CDM remains a major player in terms of market share, however, investments in CDM projects have decreased over the years due to lower prices and the slowdown of CER (“CDM”) issuance. Further uncertainties associated with the validity of the UN CDM crediting mechanism under the Paris Agreement has also contributed to its slowdown.

JCM and Plan Vivo have a negligible market share in credits issued.

6. Market share estimation is based on EY analysis. Issuances volumes by voluntary carbon schemes is entirely self-reported and unregulated. Therefore, figures are unverified by a third-party source and are subject to inaccuracy

4. Analysis: Operational Performance

Project rejection rates

Table 12 summarises the rejection rate of the schemes assessed as this could give us insights about the rigor with which the schemes are being operated. In summary:

- ▶ CDM's rejection rate appears much higher than Gold Standard. Across all schemes, high rejection rates could be due to either strong governance or poor application qualities.
- ▶ Verra did not publish statistics of rejections but it does provide information on the types of project rejected.
- ▶ JCM and Plan Vivo have a rejection rate of 0%, however this may be due to the low volume of projects registered through this scheme. There is a requirement to track rejection as the volume under these schemes increases.

Table 12: Project rejection statistics

	Rejection rate	Key reasons for rejection	Key project type rejected
Gold Standard	0.3%	<ul style="list-style-type: none"> ▶ Do not conform to compliance criteria ▶ Non-compliance to registration/verification timelines ▶ Failure to prove additionality 	<ul style="list-style-type: none"> ▶ Grid-connected renewable energy projects from middle income countries ▶ Hydropower projects located in High Conservation Values ("HCVs") areas
Verra	Data not available		<ul style="list-style-type: none"> ▶ Grid-connected electricity generation using RE ▶ All Renewable Energy projects located in Least Developed Countries ("LDCs")
CDM	7.5%	<ul style="list-style-type: none"> ▶ Failure to substantiate the additionality of the project activity ▶ Failure to provide an acceptable quantitative assessment 	<ul style="list-style-type: none"> ▶ Small wind power projects, hydro power plants, fuel switching and biomass based power plants
JCM	Data not available	<ul style="list-style-type: none"> ▶ Negative impact on sustainable development or human rights in violation of relevant laws and regulations 	<ul style="list-style-type: none"> ▶ N/A
Plan Vivo	Data not available	<ul style="list-style-type: none"> ▶ Non-compliance to Plan Vivo requirements ▶ Not acquiring sufficient start-up funding 	<ul style="list-style-type: none"> ▶ N/A

4. Analysis: Joint Crediting Mechanism (“JCM”)

This section focusses on the analysis of the JCM, which is sufficiently different to the other four short-listed schemes that it warranted a separate analysis section.

JCM is a project-based bilateral offset crediting mechanism initiated by the Government of Japan to facilitate the diffusion of low-carbon technologies and to help meet Japan’s emissions reduction target. The partnership document has been signed by 17 countries so far, including countries in Asia, Africa, Small Island Developing States (“SIDS”), Latin America and the Middle East.

The Assessment Framework used in this report was developed with the objective of assessing voluntary carbon market offset standards. While there are strong parallels between the processes used within the JCM and the other four offset schemes, the bilateral and government-led nature of the JCM means that this comparison cannot be made on a like-for-like basis.

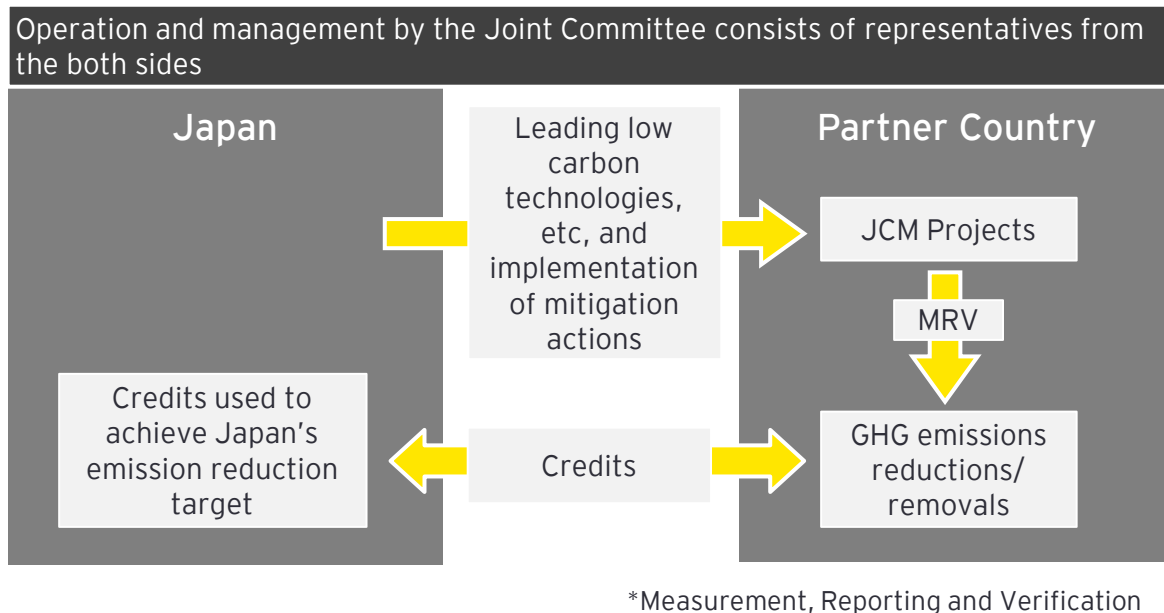


Figure 11: The JCM scheme between Japan and host country

Independence

For example, some of the processes that are carried out by independent verifiers within most carbon offset schemes are carried out by the JCM’s ‘Joint Secretariats’. Joint Secretariats are formed of representatives from Japan and each partner government. This means that the beneficiaries of the JCM (the two country governments) are in operational control of many aspects of the scheme’s processes.

The Assessment Framework developed for this project was designed to score schemes more highly when their governance was independent from the project level activities. This approach tended to see other offset schemes scoring more highly within the Framework.

4. Analysis: Joint Crediting Mechanism (“JCM”)

Documentation

Another area of differentiation between the JCM and the other offset schemes assessed was on the number of control documents that they required. For example, other offset schemes require the submission of documents to verify the legal ownership of the project by the participant, but no evidence of such a requirement could be found for JCM. Another example of the differences in this area are around the level of documentation and testing for additionality, where the documentation requirements for other offset schemes are more comprehensive than is visible within JCM.

Lastly, there is no formal definition of permanence within the JCM, nor any project documentation requirements to support this principle. The absence of permanence controls may be low risk for the project types that are currently being developed through the JCM and the option would always remain to include these requirements in the future if there were a greater need for them.

Summary

Putting all these factors together, it is therefore challenging to use the Assessment Framework in exactly the same way for the JCM, as has been applied for the other schemes. It might be the case that many of the documentation requirements and controls are assessed and reviewed within the Joint Secretariat and project development processes but these are just less visible than for the other offset schemes.

The JCM is an innovative scheme that was established very early by the Japanese government and took a lot of its processes and design from the CDM. It is commendable that the JCM has been so proactive and encouraged such broad-ranging participation from a wide range of partner countries. It will be interesting to see how the JCM responds to the evolving Article 6 landscape and the development of the other offsetting schemes.



Conclusions

There is no silver bullet or singular characteristic to determine integrity and credibility in voluntary carbon markets. Integrity in voluntary carbon markets requires establishing comprehensive principles, governance frameworks and an evolving approach to identify, assess and address emerging matters such as guidelines, regulations and best practices.

Scrutiny of international carbon markets is increasing

VCMs have gained significant momentum in the international climate agenda and there has been rapid growth over the last couple of years. The importance of VCMs has resulted in a range of offset schemes and projects being developed across the world. Alongside these projects has come a substantial range of other product and service developments, such as rating agencies, exchanges, brokers and innovations such as blockchain credits and carbon-backed indices.

As projects and schemes have expanded and the prominence of net-zero claims has increased, the quality of the offsets produced from the offsetting schemes has come under greater scrutiny. Risks such as double counting, leakage and projects not being additional exist and need to be managed by VCMs to ensure offsets are real and reliable. It is therefore essential that international carbon schemes are consistent with best practice principles, regulations and internal controls.

Framework Assessment shows Gold Standard and Verra as leaders

Our Assessment Framework has highlighted that there is a broad level of consistency between the two largest offset schemes - Gold Standard and Verra. Across the quantified scoring areas of principles and governance these two schemes take similar approaches and achieve comparable outcomes to each other. This reflects the ability that both schemes have had to draw on the knowledge and experience gained from the history of VCM activity.

CDM was the offset scheme where the most substantial differences were found between what would now be considered leading practice and its current operation. It is worth keeping in mind that CDM has however, played an important foundational role in establishing the VCM platforms which came later. Gold Standard was originally established to provide "Gold Standard CERs" and so it might not be surprising that Gold Standard (and Verra) have been able to improve upon the outcomes achieved by CDM.

5. Conclusions

Plan Vivo stands out from the other three schemes analysed within the Assessment Framework as it is much smaller and more focused on a limited range of projects and geographies. Perhaps as a function of its relative size, there are some areas of Plan Vivo's operation where there are fewer documentation requirements and/or controls than are in place within either Gold Standard or Verra.

Article 6 of the Paris Agreement will play a crucial future role in VCM development

In 2015 when the Paris Agreement was signed, Article 6 was included as a mechanism to allow countries to cooperate on efforts to meet their climate targets. Article 6 set out two pathways for countries to credit the climate benefits from projects developed in other countries, 6.2 and 6.4. Article 6.2 provides a mechanism through which countries can cooperate bilaterally or multilaterally, whereas Article 6.4 is seen as a mechanism which will supersede the CDM.

In order to ensure the environmental integrity of both 6.2 and 6.4 it was viewed as crucial that a robust set of rules was put in place to avoid the double-claiming of emission reductions. If emission reductions that occurred in one country were allowed to be counted towards the targets of another country as well then that would undermine the Paris Agreement outcomes by weakening the emission reduction ambition.

Most voluntary carbon markets are seeking to address double-claiming questions raised by Article 6 but there are a range of technical and practical questions which need to be addressed.

While our analysis has highlighted that Gold Standard has done the most of any of the shortlisted schemes to build Article 6 compliance into its operation, even their efforts are still in the early stages. The offsetting standards can do some of this work by themselves but they will need support from other parties, notably governments, in order to put theory into practice.

Appendices

Appendix A: Assessment Framework Weightings

Weightings

EY recognises that some criteria is likely to be more important than other. EY conducted a sensitivity analysis which showed that a uneven weightings had negligible implications to the overall weighted average results. Weightings have therefore been evenly distributed.

The only exceptions to the use of even weightings were for double-issuance, double-use, double-claiming, SDG alignment and non-carbon benefits. Double-issuance, double-use and double-claiming are all elements of double counting. As such, each of these sub-criteria were assigned a third of the weighting of a regular criteria so that double counting did not appear three times as important as other criteria.

The same approach was applied to SDG alignment and non-carbon benefits, as these are both criteria that fall under benefits additional to emissions reductions. SDG alignment and non-carbon benefits were each assigned half the weighting of a regular criteria.

Principles		
1	Double issuance	3.03%
2	Double use	3.03%
3	Double claiming	3.03%
4	Additionality	9.09%
5	Permanence	9.09%
6	Transparency	9.09%
7	Quantifiability	9.09%
8	Baseline Setting	9.09%
9	Leakage avoidance	9.09%
10	Stakeholders inclusivity	9.09%
11	Legal compliance	9.09%
12	Safeguards against negative impacts / Do no harm principle	9.09%
13	SDG Alignment	4.55%
14	Non-carbon benefits	4.55%
	Total	100%

Governance		
1	Standard governance framework	11.1%
2	Methodology certification / modification	11.1%
3	Crediting period	11.1%
4	Project documentation requirements	11.1%
5	Stakeholder engagement	11.1%
6	Validation and verification body requirements	11.1%
7	Measurement, Reporting and Verification Procedure	11.1%
8	Complaint and appeal procedure	11.1%
9	Credits trading procedure	11.1%
	Total	100%

6. Appendices

Appendix B: Scheme Comparison

Principles									
#	Criteria	Gold Standard		Verra		Plan Vivo		CDM	
		Score	*Note	Score	*Note	Score	*Note	Score	*Note
1	Double issuance	100%		63%		88%		63%	
2	Double use	83%		83%		100%		67%	
3	Double claiming	92%		58%		75%		75%	
4	Additionality	94%		89%		72%		94%	
5	Permanence	94%		100%		81%		94%	
6	Transparency	100%		79%		71%		93%	
7	Quantifiability	100%		100%		100%		100%	
8	Baseline Setting	88%		100%		81%		88%	
9	Leakage avoidance	100%		100%		75%		100%	
10	Stakeholders inclusivity	83%		83%		83%		83%	
11	Legal compliance	100%		100%		100%		50%	
12	Safeguards against negative impacts / Do no harm principle	100%		50%		80%		20%	
13	SDG Alignment	100%		100%		17%		0%	
14	Non-carbon benefits	79%		79%		100%		43%	
Principles overall weighted average score		95%		87%		81%		74%	

Governance									
#	Criteria	Gold Standard		Verra		Plan Vivo		CDM	
		Score	*Note	Score	*Note	Score	*Note	Score	*Note
1	Standard governance framework	80%		100%		50%	*	60%	*
2	Methodology certification / modification	100%		100%		100%		67%	*
3	Crediting period	100%		100%		75%		100%	
4	Project documentation requirements	100%		100%		67%		83%	
5	Stakeholder engagement	63%		75%		50%		75%	
6	Validation and verification body requirements	100%		100%		88%		88%	
7	Measurement, Reporting and Verification Procedure	100%		90%		80%		60%	*
8	Complaint and appeal procedure	100%		100%		67%		0%	
9	Credits trading procedure	50%		50%		50%		67%	
Governance overall weighted average score		88%		91%		70%	*	67%	*

6. Appendices

Appendix C: Gold standard

Key performance indicators (“KPIs”)

There are a number of KPIs related to the operations layer that cannot be given a quantitative analysis. The key insights from these KPIs will be presented here for reference.

	Assessment
Project type and methodology	<ul style="list-style-type: none"> ▶ 40% of projects issues from Renewable Energy Projects and 0% from REDD+ projects ▶ 55 methodologies used, with 11 contributing to over 85% of credits issued ▶ 4 new/updated methodologies in 2021 ▶ 2 processes for methodology approval (fast-track and regular)
Growth	<ul style="list-style-type: none"> ▶ In 2021 149 project registered with a volume of 43.8mn credits ▶ Up to 2021, over 2300 projects registered with a volume of 198.5mn credits ▶ Total credits retired (VERs + CERs) till 2021 was 101.35mn credits
Acceptability	<ul style="list-style-type: none"> ▶ Three pricing initiatives are accepting credits issued; Colombia carbon tax, CORSIA and South Africa carbon tax ▶ Six carbon certification methods are accepting credits issued; Climate Active (Australia); carbonZero certification (NZ); CarbonFree® Product Certification (USA); PAS 2060 (UK); Carbon Neutral Protocol (UK); QAS for Carbon Offsetting (Private) ▶ Credits certified are only trading on one carbon market exchange; Carbon Trade Exchange
Regional and sector diversity	<ul style="list-style-type: none"> ▶ 98 countries have projects from the standard ▶ Majority of credits (43%) issued in Asia, followed by Europe (25.2%), Africa (22.3%), and South and North America (both 4.5%) ▶ 7 out of the 12 sectors are covered by the scheme
Project Issuance and Retirement	<ul style="list-style-type: none"> ▶ Maximum timeframe of 2 years between listing and design certification wherein the project undergoes preliminary and design review, validation, verification and a performance review ▶ Rejection rate of 0.3% in 2017 due to non-conformance of compliance criteria ▶ Rejection reasons include: grid-connected renewable energy in middle-income countries, hydropower projects in HCV areas, activities making use of non-renewable biomass resources and co-firing of waste within incineration or gasification facilities ▶ Projects are eligible for re-crediting after the end of the first crediting cycle ▶ Two grievances were raised in 2020, 1 in 2019, 2 in 2015 and 1 in 2011 ▶ Gold standard has linkages with many strategic partners such as Danone, WWF, MARS, CDP, etc. It also has partnership with many institutional partners like Australian AID, BID, World Bank Group, etc.
Presence of Verification bodies	<ul style="list-style-type: none"> ▶ 21 VVBs are present ▶ Relatively stringent process for empanelment for VVBs including requirements for an online exam, regular trainings and valid accreditation from ISO 14065 / UNFCCC-CDM / ASI - FSC

6. Appendices

Appendix D: Verra

Key performance indicators (KPIs)

There are a number of KPIs related to the operations layer that cannot be given a quantitative analysis. The key insights from these KPIs will be presented here for reference.

	Assessment
Project type and methodology	<ul style="list-style-type: none"> ▶ 37% of projects issues from Renewable Energy Projects and 17.2% from REDD+ projects ▶ Over 50 methodologies used, with 8 contributing to over 80% of credits issued ▶ 2 new methodologies are open for public comment and 13 are under assessment ▶ Methodology approval process follows clear process including 30-day public consultation and VVB validation and approval
Growth	<ul style="list-style-type: none"> ▶ In 2021, 517 project registered with a volume of 295mn credits ▶ Up to 2021, 1490 projects registered with a volume of 835.5mn credits ▶ Total credits retired till 2021 was 235.6mn credits
Acceptability	<ul style="list-style-type: none"> ▶ Three pricing initiatives are accepting credits issued; Colombia carbon tax, CORSIA and South Africa carbon tax ▶ Six carbon certification methods are accepting credits issued; Climate Active (Australia); carbonZero certification (NZ); CarbonFree® Product Certification (USA); PAS 2060 (UK); Carbon Neutral Protocol (UK); QAS for Carbon Offsetting (Private) ▶ Credits certified are trading on two carbon market exchanges; Carbon Trade Exchange and The Santiago Climate Exchange
Regional and sector diversity	<ul style="list-style-type: none"> ▶ 78 countries have projects from the standard ▶ Majority of credits (55%) issued in Asia and Oceania, followed by the Americas (26%), Africa (13%) and Europe (5%) ▶ 10 out of the 12 sectors are covered by the scheme
Project Issuance and Retirement	<ul style="list-style-type: none"> ▶ Review process of 40 days ▶ No information available on rejection rate ▶ Excludes projects that can reasonably re assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal or destruction. Additionally excludes all renewable energy projects not located in least developed countries ▶ Projects are eligible for re-crediting after the end of the first crediting cycle ▶ No information available on complaint procedures underwent ▶ There is a vertically integrated standard, operating its own registry and active collaborations with exchanges, brokers and institutional organisations.
Presence of Verification bodies	<ul style="list-style-type: none"> ▶ 26 VVBs are present ▶ 2 pathways for VVBs; approval under a VCS (such as CDM) or accreditation by an IAF

6. Appendices

Appendix E: Plan Vivo

Key performance indicators (KPIs)

There are a number of KPIs related to the operations layer that cannot be given a quantitative analysis. The key insights from these KPIs will be presented here for reference.

	Assessment
Project type and methodology	<ul style="list-style-type: none"> ▶ 0% of projects issues from Renewable Energy Projects and 16.35% from REDD+ projects ▶ Low number of methodologies approved ▶ Does not provide its own or specific methodologies to measure CO₂- fixation. Any project can apply under an Approved approach or can develop or adopt their own approach for estimation emissions and removals ▶ No data available on new/updated methodologies in 2021, 27 new projects are upcoming which have started their registration process ▶ Approval process involves the technical advisory committee to review all methodology process requests
Growth	<ul style="list-style-type: none"> ▶ In 2021 5 projects registered with a volume of 1mn credits ▶ Up to 2021, 27 projects were registered with a volume of around 5mn credits ▶ Total credits retired till 2021 was 2.7mn credits
Acceptability	<ul style="list-style-type: none"> ▶ No data available
Regional and sector diversity	<ul style="list-style-type: none"> ▶ 20 countries have projects from the standard ▶ Majority of credits issued in Latin America (55%), followed by Africa (25%), Asia (15%), and Oceania (5%) ▶ 2 out of the 12 sectors are covered by the scheme. These are focused on forestry and other land use.
Project Issuance and Retirement	<ul style="list-style-type: none"> ▶ Duration of about 2 years between start of project period and validation stage (this can include initial activities, e.g. developing pilot studies, or seeking approvals) ▶ Rejection rate is unknown but rejection reasons include: sufficient start-up funding hasn't been acquired, or requirements of the Plan Vivo Standard haven't been met ▶ Projects are eligible for re-crediting after the end of the first crediting cycle ▶ Plan Vivo allows projects that may fit within other standards (although projects have to inform the Plan Vivo Foundations to ensure double-counting does not occur)
Presence of Verification bodies	<ul style="list-style-type: none"> ▶ 9 VVBs are present ▶ VVBs are approved based on appropriate experience and expertise in community-based Payments for Ecosystems Service projects and have valid accreditation from ISO 14065 / UNFCCC-CDM / ASI - FSC

6. Appendices

Appendix F: CDM

Key performance indicators (KPIs)

There are a number of KPIs related to the operations layer that cannot be given a quantitative analysis. The key insights from these KPIs will be presented here for reference.

	Assessment
Project type and methodology	<ul style="list-style-type: none"> ▶ 30% of projects issues from Renewable Energy Projects and less than 1% from REDD+ projects ▶ Over 100 methodologies used, with 9 contributing to over 75% of credits issued ▶ Over 10 new methodologies applied to enter the scheme in 2021 ▶ Robust methodology approval process, allowing for revision of an approved methodology for additional clarification
Growth	<ul style="list-style-type: none"> ▶ In 2021 328 project registered with a volume of 101.02mn credits ▶ Up to 2021, 3,433 projects registered with a volume of 2,202.9mn credits ▶ Total credits retired till 2021 was 118.2mn credits with 4.8mn retired in the voluntary cancellation platform
Acceptability	<ul style="list-style-type: none"> ▶ Six pricing initiatives are accepting credits issued; Colombia carbon tax, CORSIA, EU ETS, Mexico carbon tax, Republic of Korea ETS, South Africa carbon tax ▶ Five carbon certification methods are accepting credits issued; Climate Active (Australia), CarbonZero certification, PAS 2060, Carbon Neutral protocol, QAS for carbon offsetting ▶ Credits certified are trading on three carbon market exchanges; AirCarbon Exchange (ACX), Carbon Trade Exchange (CTX) and CBL Markets
Regional and sector diversity	<ul style="list-style-type: none"> ▶ 82 countries have projects from the standard ▶ Majority of credits issued in Asia and Oceania (80%), followed by the Americas (15%), Africa (4%) and Europe (1%) ▶ 10 out of the 12 sectors are covered by the scheme
Project Issuance and Retirement	<ul style="list-style-type: none"> ▶ Shortest registration process of 58 days. Validation however can take from 9 months to 2 years ▶ 7.5% of projects from 2006-2020 have been rejected. Individual rejection reasons are publicly available. ▶ Key reason for rejection is the failure to substantiate additionality. Projects previously rejected include small wind power, hydropower and biomass based power plants ▶ Re-crediting is allowed, however the type of crediting period (fixed or renewable) is pre-decided ▶ Transparent complaint procedures ▶ Maintains its own Registry and actively collaborates with CTX and AirCarbon Exchange to promote carbon offsetting
Presence of Verification bodies	<ul style="list-style-type: none"> ▶ 29 VVBs are present ▶ VVBs are individually assessed by the CDM team, Accreditation Panel and executive board

6. Appendices

Appendix G: JCM

Key performance indicators

There are a number of KPIs related to the operations layer that cannot be given a quantitative analysis. The key insights from these KPIs will be presented here for reference.

	Assessment
Project type and methodology	<ul style="list-style-type: none"> ▶ 32% of projects issues from Renewable Energy Projects and only one approved project is based on REDD+ methodology ▶ Bilateral agreements with 17 countries with methodologies differing per country agreement. Overall the distribution of projects between approved methodologies is fair. ▶ 7 new methodologies applied in 2021 in Indonesia and Thailand ▶ Methodology approval occurs in collaboration of each country with the Joint Committees reviewing each application
Growth	<ul style="list-style-type: none"> ▶ In 2021 6 projects registered with a volume of 0.117mn credits ▶ Up to 2021, 71 projects registered with a volume of 1.968mn credits ▶ The amount of retired credits was unavailable
Acceptability	<ul style="list-style-type: none"> ▶ No data available
Regional and sector diversity	<ul style="list-style-type: none"> ▶ 17 countries have projects from the standard ▶ Majority of credits issued in Asia and Oceania (97.7%), followed by Latin America (1.8%), Oceania (0.33%) and Africa (0.2%) ▶ 3 out of the 12 sectors are covered by the scheme
Project Issuance and Retirement	<ul style="list-style-type: none"> ▶ Project development cycle involves methodology approval, validation, registration, monitoring, verification and the issuance of credits post checking completion of the verification report ▶ No data available on project rejection ▶ No data available on re-crediting ▶ No data available on complaint or review procedures ▶ Collaboration with various international financing schemes and collaboration with the "city-to-city collaboration programme for a decarbonised society"
Presence of Verification bodies	<ul style="list-style-type: none"> ▶ 97 VVBs are present ▶ VVBs are designated by the Joint Committee and accredited according to expertise and are either entities accredited under ISO 14065 or designated operational entities accredited by the Executive Board under the CDM

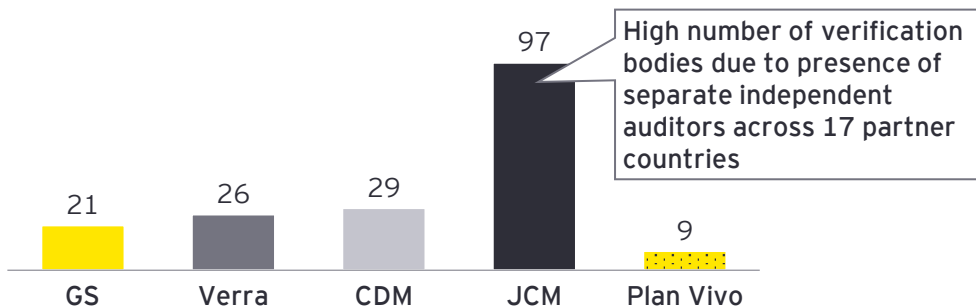
6. Appendices

Appendix H: Performance indicators

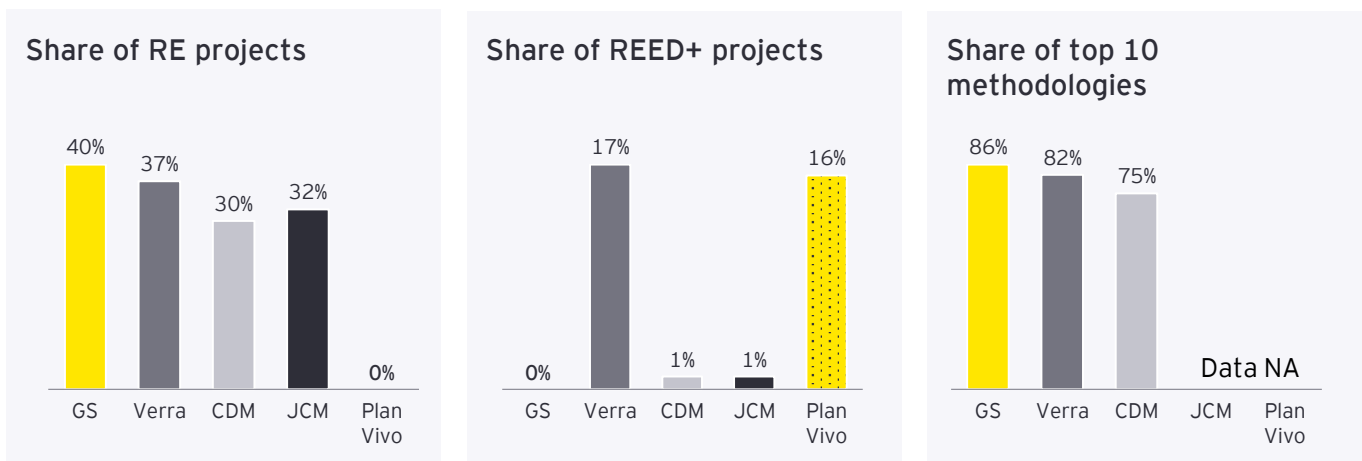
Robustness of VVB application approval process

	Key project type rejected
Gold Standard	<ul style="list-style-type: none"> ▶ Strict requirements and detailed application form ▶ Online exam is conducted and regular trainings are facilitated ▶ Must hold a valid accreditation from ISO 14065 / UNFCCC-CDM / ASI - FSC ▶ Microscale projects are allowed for internal verification
Verra	<ul style="list-style-type: none"> ▶ Either approval from VCS-approved GHG program such as CDM or accreditation by an International Accreditation Forum (IAF) member body may be required
CDM	<ul style="list-style-type: none"> ▶ Stringent requirements and detailed documentations ▶ Assessed by the CDM Assessment Team, CDM Accreditation Panel and CDM EB
JCM	<ul style="list-style-type: none"> ▶ Accredited by the Joint Committee of the respective host country ▶ Accreditation under ISO 14065 or DOE accreditation under CDM may be required
Plan Vivo	<ul style="list-style-type: none"> ▶ Accreditation an international certification authority such as the UN, ISO, California Climate Action Registry, FSC, and other certification programmes is required ▶ Microscale projects are allowed for internal verification

Presence of verification bodies



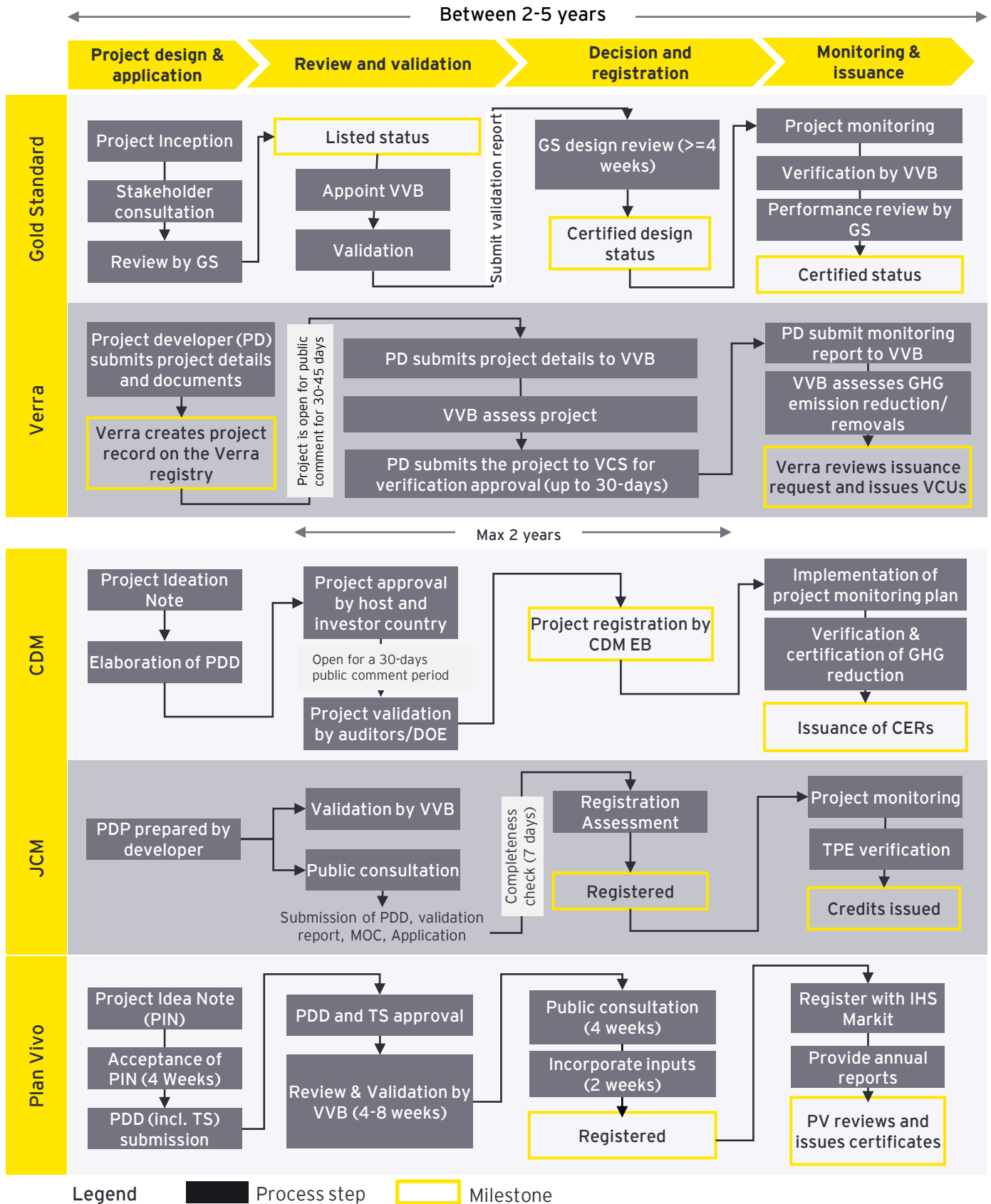
Project type and methodology per standard



6. Appendices

Appendix H: Performance indicators

Project development cycle for project based on already approved methodology⁸



8. In case existing methodology is not used for project registration, additional time is required for review and approval of the proposed methodology

6. Appendices

Appendix I: Consultations

The following organisations were included within the consultation process:

Organisation	Representatives
Department of Industry, Science, Energy and Resources	<ul style="list-style-type: none">▶ Kath Rowley, Head of Division, Climate Change▶ David Higgins, General Manager, International Climate & Technology Strategy▶ Conrad Buffier, General Manager, Climate Change Policy▶ Alannah Pentony, General Manager Emissions Reduction▶ Daniel Sheedy, Director, Climate Active▶ Julia Gardiner, Director, International Climate Policy and Negotiations▶ Kaylene Flanagan, Assistant Director, International Markets and Partnerships▶ Chris How, Assistant Director▶ Nick Williams, Assistant Director, Climate Change
Carbon Market Institute	<ul style="list-style-type: none">▶ Gloria Karaiskos - Director, Climate Change▶ Gabriella Warden - Manager, Research and Government Relations
Stockholm Environment Institute	<ul style="list-style-type: none">▶ Derik Broekhoff, Senior Scientist
Carbon & Clean Energy Solutions	<ul style="list-style-type: none">▶ Anil Bhatta, Managing Director

6. Appendices

Appendix J: Longlist of international offset schemes

Carbon offset scheme and description	Rationale for exclusion
<p>American Carbon Registry (“ACR”)</p> <ul style="list-style-type: none"> ▶ ACR is the first private voluntary GHG registry in the USA ▶ Registers global carbon offsets 	<ul style="list-style-type: none"> ▶ Limited geographical presence (majority of projects are based in the US) ▶ Similar to Verra’s features and operations, the largest carbon offset scheme by market share
<p>Regen Registry</p> <ul style="list-style-type: none"> ▶ Regen is an emerging program based in the US ▶ Only 6 projects registered up to 2021 focussing on removals ▶ Three other projects in Australia, one in the US, one in Kenya and one in Congo 	<ul style="list-style-type: none"> ▶ Immature scheme ▶ Low number of registered projects ▶ Also recognises and accepts other registries such as Verra and Gold Standard, risking overlap
<p>Climate Action Reserve (“CAR”)</p> <ul style="list-style-type: none"> ▶ CAR is based in California and the major project types are improved forest management and livestock conservation ▶ 1.61 mntCO₂ issued in 2021 (171.3 mntCO₂ till 2021); 99% of registered credits based out of United States 	<ul style="list-style-type: none"> ▶ Limited geographical presence (majority of projects are based in the US, and all others in Mexico) ▶ Similar to Verra’s features and operations, the largest carbon offset scheme by market share
<p>Joint Implementation</p> <ul style="list-style-type: none"> ▶ Established in 1997, allowing countries under the Kyoto Protocol to earn emission reduction units by financing projects in other eligible countries and receiving the resultant credits ▶ Operations similar to CDM but limited to only 17 countries 	<ul style="list-style-type: none"> ▶ Similar to CDM’s in that both are Kyoto Protocol mechanisms with similar operations ▶ Has come under public scrutiny for additionality ▶ Limited geographical presence (majority of projects are based in Russia and Ukraine)
<p>UK Woodland Carbon Code</p> <ul style="list-style-type: none"> ▶ UK based standard with focus on afforestation projects ▶ Only 7% of projects have been verified, equivalent to 10% of total issued credits 	<ul style="list-style-type: none"> ▶ Limited geographical presence ▶ Low issuance rates

6. Appendices

Appendix J: Longlist of international offset schemes

Carbon offset scheme and description	Rationale for exclusion
<p>Architecture for REDD+ Transactions / The REDD+ Environmental Excellence Standard</p> <ul style="list-style-type: none"> ▶ Voluntary carbon program to reduce emissions from deforestation and forest degradation, as well as the sustainable management of forests and the conservation and enhancement of forest carbon stocks in developing countries ▶ Participant must be a national government or sub-national government with national government approval 	<ul style="list-style-type: none"> ▶ Low number of registered projects ▶ Limited information on issued credits publicly available
<p>Global Carbon Council (“GCC”)</p> <ul style="list-style-type: none"> ▶ GCC is an emerging program and the first program available to the Middle-East and North Africa (“MENA”) region ▶ Only 2 out of 180 project applications have been approved to date. Both of these are renewable projects in Turkey 	<ul style="list-style-type: none"> ▶ Immature scheme ▶ Low number of registered projects ▶ Currently limited geographical presence
<p>China GHG Voluntary Emission Reduction Program</p> <ul style="list-style-type: none"> ▶ Offers project-based voluntary emission reductions of 6 GHG types across China ▶ 60% projects are renewable energy based, others include Energy efficiency, waste management and fuel switch 	<ul style="list-style-type: none"> ▶ Limited geographical presence (only in China) ▶ Detailed data is not available for analysis
<p>Republic of Korea Offset Credit Mechanism</p> <ul style="list-style-type: none"> ▶ Implemented by the government to support the Korea Emissions Trading Scheme (“KETS”) in the use of domestic carbon offsets ▶ Projects need to be owned by Korean enterprises and registered under the CDM 	<ul style="list-style-type: none"> ▶ Operationally dependent on the CDM ▶ Limited geographical presence (only in the republic of Korea)

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