Technical Consultative Note for Delivery of a Common Carbon Credit Data Model

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This Technical Consultative Note was authored by the Secretariat of the Climate Data Steering Committee, Lead Knowledge Partner for one of the G20 Finance Track's Sustainable Finance Working Group's 2025 Work Priorities: "Unlocking the Financing Potential of Carbon Markets" (Priority 3).

Purpose of this Technical Consultative Note

This Technical Consultative Note sets out a proposal for a Common Carbon Credit Data Model developed by the Secretariat of the Climate Data Steering Committee, in support of the South African G20 Presidency's focus on Unlocking the Financing Potential of Carbon Markets. The Data Model is available here in spreadsheet format. The consultation is relevant to—and responses are highly encouraged from—a diverse set of respondents, such as project developers; financing partners; potential buyers; providers of market services and infrastructure, including registries and exchanges; policymakers from buyer and seller countries; other relevant technical bodies and standard setters; and civil society groups. Responses are welcome and encouraged from within and beyond the G20 and from existing carbon market participants and potential new entrants.

Responses to this consultation should be submitted by 12 August 2025 and should be provided using the response form. The full list of questions is also set out in Annex D of this note. Those responding can indicate whether the response is public or private, and responses marked private will not be published. All responses, public and private, will be considered. In advance of the September sitting of the G20 Finance Track's Sustainable Finance Working Group (SFWG) an anonymised summary of feedback received, noting how the Data Model would be updated in response, will be prepared.

The goal is for the updated Data Model to be piloted with willing jurisdictions and market participants. Stakeholders will therefore have significant opportunity to contribute to and shape the development of this resource, which is intended to be a public good.

Executive Summary

Under the South African G20 Presidency, the G20 Finance Track's Sustainable Finance Working Group (SFWG) has identified unlocking the financing potential of carbon credit markets as one of its three priorities for 2025, with a particular focus on improving carbon credit data standardisation.[1] Carbon credit markets currently account for a small proportion of investment into decarbonisation, accounting for approximately US$1.4 billion of finance in 2024.[2] However, with the right underpinnings, including to support high environmental integrity and robust market practices and infrastructure, carbon markets have the potential to scale, channelling investment to critical mitigation projects that are otherwise difficult to finance. In its 2025 work, the G20's SFWG specifically aims to contribute to increasing data standardisation in carbon credit markets, given the G20 Finance Track's expertise on enabling resilient cross-border financial flows underpinned by effective and transparent markets, appropriate data, reporting, and infrastructure.

The specific context for this priority is one where over the past decade, significant progress has been made in developing carbon crediting frameworks internationally. The operational rules for international cooperation under Article 6 of the Paris Agreement are being finalised, with rules for bilateral trading of mitigation outcomes under Article 6.2 agreed at COP29, and a global crediting mechanism under Article 6.4 (called the Paris Agreement Crediting Mechanism or PACM) forthcoming. Additionally, the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), established by the International Civil Aviation Organization (ICAO), represents the first global sectoral crediting market with mandatory offsetting rules, requiring airline operators to offset a portion of their emissions growth using eligible carbon credits.

Alongside these UN-led mechanisms, a Voluntary Carbon Market (VCM) has developed largely organically with intensified and ongoing efforts to address environmental integrity concerns and build the necessary technical underpinnings, such as data standards, legal and accounting treatments, and market infrastructure. Over the last few years, the work of the Integrity Council for the Voluntary Carbon Market (ICVCM) has supported development of global indicators for high-integrity credits against which carbon crediting programmes and credit methodologies are being assessed.[3] Several public, private, and voluntary sector efforts are being made to stimulate demand and support companies in making credible carbon credit claims.[4] Increasingly, focus is turning to data, legal, and accounting issues, as well as the practices and infrastructure needed to support fair and effective markets.

A lack of data standardisation is currently one factor impeding market functioning. As identified by bodies such as the World Bank and IOSCO, participants at each stage of the carbon credit lifecycle—from project developers to buyers—use different norms and systems to record and store data, creating data fragmentation and a lack of data standardisation. At the same time, different carbon credit demand segments—such as the Article 6 market, CORSIA, and the VCM—all draw on the same pools of underlying projects but suffer from fragmentation by operating in parallel, often with different rules, methodologies, registries, and data and reporting systems.[5]

This data fragmentation and lack of standardisation can have significant real-world costs. Specifically, a lack of data standardisation and fragmentation can make it more difficult for policymakers to set up national and sub-national registries and to trace the provenance of credits—leading to an elevated risk of double counting. Data quality issues can also hamper the provision of market services such as trading of standardised instruments on exchanges, specialised rating services, and market analytics.

[1] G20 Sustainable Finance Working Group: 2025 Presidency and Co-chairs Note on Agenda Priorities (2025).
[2] MSCI: Frozen carbon market may thaw as 2030 gets closer (2024).
[3] Integrity Council for the Voluntary Carbon Market.
[4] Including the work of the Voluntary Carbon Markets Integrity Initiative (VCMI).
[5] IOSCO: Voluntary Carbon Markets (2024) and World Bank: Technical Guidance Note on Enhancing Data and Systems Interoperability for Carbon Markets: Current Landscape and Strategic Recommendations (2025).

Investors' ability to conduct thorough due diligence and. consequently, their willingness to provide long term capital may also be impacted by data availability and quality. All-in-all, a lack of standardisation erodes confidence in carbon credit markets and hinders buyers' ability to easily identify, compare, and purchase credits.

To help address data fragmentation and a lack of data standardisation, the G20 Financial Track's SFWG has discussed guiding principles for the development of a common data model for carbon credit markets. In general, a data model is a resource that identifies key data fields and makes recommendations on how to standardise them, including through suggested names, encodings, data, and unit types, and, in some cases, predefined values. Such work to standardise data can have public good benefits that would not necessarily be achieved without leadership from policymakers. The SFWG has discussed principles that could guide development of an effective data model for carbon credit markets identifying that it would: (i) be delivered as a public good, (ii) consider the entire carbon credit life cycle, (iii) incorporate best practice from financial markets, (iv) employ accessible technology, (v) respect policymaker sovereignty, and (vi) align with negotiated multilateral outcomes. These principles are described in more detail in Figure A.

Figure A: Guiding principles for an effective data model for carbon credit markets as discussed by the SFWG

1. Be delivered as a public good
The Data Model should be transparent and openly accessible to all—serving as a common foundation that captures the core data fields to be standardised and can be built upon by policymakers, other practitioner-led initiatives and wider stakeholders on a voluntary basis
2. Consider the entire carbon credit life cycle
The Data Model should cover the entire carbon credit life cycle, providing a voluntary common foundation for all market participants. This would ensure that all carbon credit market participants from project developers to registries to exchanges can record data in a way that is interoperable across their respective data systems
3. Incorporate best practice from financial markets
The Data Model should facilitate cross-border flows by improving data infrastructure including, but not limited to, developing unique identifiers which, like ISINs in financial markets, support traceability and trading of carbon credits across borders. It should learn from the successes of financial markets in this respect, but should not take a view on whether carbon credits should be treated (and regulated) as financial instruments
4. Employ accessible technology
The Data Model should be presented in an accessible format —for example, in spreadsheet format—such that market participants and policymakers do not face technology-related barriers to using the resource
5. Respect policymakers' sovereignty
The Data Model should be a resource for voluntary adoption to support data standardisation and it should not impede policymakers from developing their own jurisdictional views on policy including (but not limited to) the relationship between carbon markets and carbon pricing mechanisms; the regulatory treatment of carbon credits (by financial regulators or otherwise); and disclosure rules
6. Align with negotiated multilateral outcomes
The Data Model should align with internationally agreed outcomes negotiated at the Conference of Parties (COP). It should be respectful of the UNFCCC's processes, integrating and supporting dissemination of Article 6 reporting guidance

To support data standardisation and integration, the Climate Data Steering Committee (CDSC), acting as Lead Knowledge Partner to the G20 SFWG for Priority 3, has worked to develop a draft Common Carbon Credit Data Model (the Data Model) in line with these principles. The Data Model developed and presented in this Technical Consultative Note identifies the core data fields that are important for interoperability of carbon credit market participants' data systems and cross-border tracking and trading along the carbon credit life cycle and provides guidance on standardisation of these data fields. It is intended that the Data Model would serve as a voluntary common foundation for data standardisation that a broad set of public and private sector stakeholders could choose to build on as they develop and evolve approaches to recording, sharing, and disclosing carbon credit data. More details on the CDSC are provided in Box 1.

The CCC Data Model is being developed by the Climate Data Steering Committee (CDSC) at the request of the G20 SFWG. More details on the CDSC are provided in Box 1.

BOX 1

The Climate Data Steering Committee

The Climate Data Steering Committee (CDSC) was established in June 2022 to accelerate and help build a broadly accessible foundation of high-quality climate data that is critical to supporting capital providers in identifying opportunities to invest in the net-zero transition. In 2022, the CDSC set out recommendations for the development of a centralised open data repository of private sector transition-related data, the Net-Zero Data Public Utility (NZDPU), which would include data on Scope 1, 2 and 3 emissions; emissions reductions targets; and carbon credit use. As a general matter, carbon credit data is not well standardised currently.

The CDSC, with support of its Secretariat, convenes key global regulators, policymakers, and standard setters with an interest in ensuring that core corporate level transition data is disclosed in a standardised way. The CDSC Secretariat is delivering the work on the Data Model with guidance from a Policy Working Group (PWG) staffed by technical delegates and meeting at regular intervals.

The Data Model outlined in this Technical Consultative Note is relevant to carbon credits in general with some important caveats. The model is relevant to all carbon credits, including those used (i) for voluntary purposes, (ii) for compliance with CORSIA requirements, (iii) in relation to obligations under compliance carbon pricing mechanisms where policymakers have deemed appropriate, and (iv) under Article 6 with the necessary authorisations. The standardised reporting fields for bilateral agreements under Article 6.2 are fully captured by the Data Model, but data requirements for Article 6.4 are not yet finalised so are not captured.

If widely deployed, the Data Model could have significant benefits including:

- **Enabling interoperability of carbon credit data systems across market participants.** Market participants recording information following a consistent approach, such as that suggested in the Data Model, would allow for greater interconnection and easier exchange of information throughout the market, improving market functioning.
- **Strengthening emissions accounting and reducing the risk of double counting.** Assigning unique identifiers to credits—identifying projects and credit batches—would support more consistent recording, exchange, and comparison of data, better supporting detection of duplicates across registries, mitigating risks of reissuance and overlapping claims.

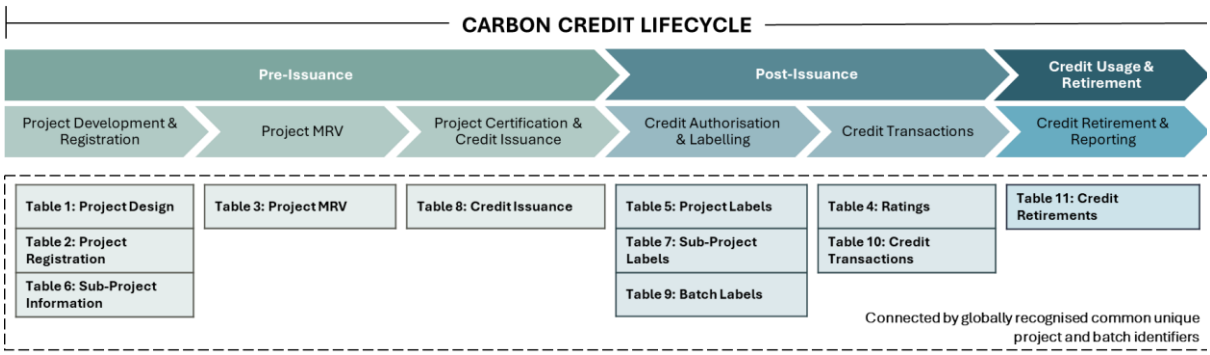
- **Supporting policymakers to set up national and sub-national registries with greater ease and efficiency.** The Data Model can provide a foundation that policymakers build on, supporting the many jurisdictions currently considering registry design and promoting alignment across jurisdictions that choose to use the Data Model.
- **Reducing transaction costs for buyers by improving their ability to compare credits.** Knowing that all market participant data systems are 'speaking the same language' reduces transaction costs for buyers and may therefore support those wanting to buy at scale. For example, the Data Model could enable buyers to more easily identify credits with characteristics relevant to their needs (e.g., from a certain sector, risk profile, or eligible for compliance use in a particular emissions trading system) and make apples-to-apples comparisons of credits knowing the underlying data has been standardised.

The key design features of the Data Model outlined in this Technical Consultative Note are as follows:

- **It covers the entire carbon credit life cycle end-to-end.** The Data Model contains suggested data fields organised across 11 tables, a structure that broadly reflects stages in the carbon credit life cycle from project design and development to credit issuance, transactions, and ultimately retirement. The Data Model structure is illustrated in Figure B below. In determining the data fields to include, consideration was given to striking a balance between including critical data fields along the entire life cycle, while ensuring that the Data Model remains proportionate, providing a foundation that a diverse set of stakeholders can build upon.
- **It provides suggested approaches to standardising core data fields.** This takes the form of suggested data field naming conventions, descriptions, encodings, data and unit types, and in some cases illustrative picklists. Metadata and indicators to reflect whether data is static or changing have also been included to illustrate common data management best practices. In determining the extent to which data fields could be standardised, consideration was given to striking a balance between the usefulness of standardising fields for market participants (e.g., through picklist values), while maintaining the need for flexibility in some cases.

It is made available in an accessible, technology-agnostic format. A spreadsheet format was chosen to ensure the Data Model remains accessible to a broad range of users and to support different implementation approaches, including varying database tools or distributed ledger technologies.

Figure B: Data Model structure mirroring carbon credit life cycle



The proposed introduction of a system of carbon credit ecosystem-wide unique identifiers for projects and credit batches—critical for enhancing traceability of credits and reducing the risk of double counting—is a distinctive contribution of the Data Model. Carbon credit markets currently lack standardised, global unique identifiers to the level of projects and credit batches; this hinders the ability to track credits across the life cycle and across borders, ultimately increasing the risks of double counting and reducing trust in the market. To address these challenges, the Data Model proposes a common

approach to developing a unique identifier that extends to project and batch level—based on best practice and insights from more mature markets—that users can extend to the credit level if they wish. The proposed unique identifier format is designed to be technology-agnostic and machine-readable. Insights from the design of International Securities Identification Numbers (ISINs), which is used to identify securities in cross-border transactions, have been applied to enable smoother cross-border trading of credits. Generating and assigning these credits would require a suitably qualified body—for example, a national numbering agency or stock exchange—to be appointed in each country. Implementing the proposed approach would require piloting and testing with willing jurisdictions and registries, and a transition period for wider implementation.

Several additional design choices had to be made while developing the Data Model, most notably:

- **Accounting for multiplicity.** The Data Model is designed around a principle of data normalisation, which requires that every cell has a unique value, and every record be unique wherever possible. However, within a given carbon credit project there may be cause to capture multiple values for a specific data field, for example, for those projects that span multiple sectors, methodologies, mitigation types, or jurisdictions. The Data Model uses picklists where possible to ensure unique values, but in cases where multiple responses are required, it introduces a Sub-Project Information data table.
- **Eligibility labels.** Market participants have communicated that they want to be able to identify carbon credits deemed eligible for use in carbon pricing schemes, or other internationally recognised indicators of credit integrity, and which may command a price premium. The Data Model includes data fields that seek to capture a factual record of credit eligibility, drawing on publicly available information. Labels capture eligibility that has been decided by responsible policymakers and regulators, and project developers would not be able to state eligibility for the purposes of the Data Model.
- **Alignment with Article 6 reporting guidance.** The Data Model is designed to align with Article 6 guidance and as such can support recording of data for credits transacted through Article 6. The current draft of the Data Model replicates the Agreed Electronic Format (AEF) reporting guidance for Article 6.2 in its entirety, with separate sheets for each of the tables in the AEF template. The Data Model does not yet include data fields related to the Article 6.4 PACM, given operational rules for the mechanism are still being negotiated, but will be updated to do so when guidance is finalised.

Voluntary uptake by national, sub-national, and independent registries will be critical to building momentum and validating the Data Model's utility. Within the carbon credit market ecosystem, registries are responsible for recording and storing a majority of the data, including on project design, credit issuance, and retirement. Project developers will also typically record project data in accordance with documentation templates issued by registries. To ensure the Data Model is practical and effective, it must be tested and refined in collaboration with both national registries—which oversee international emissions accounting—and independent registries.

Broader adoption of the Data Model as a voluntary but common foundation would require engagement with—and action from—additional participants across the carbon credit markets value chain. This includes buyers and buyer coalitions advocating for the use of the Data Model and creating demand side pressure for standardisation; market intermediaries ensuring that standardised approaches are maintained across credit verification and trading workflows; other data and market infrastructure initiatives reflecting and, where applicable, adopting the Data Model as a common foundation; and, all market participants sharing feedback and participating in external communications (e.g., case studies) related to the Data Model.

National governments and regulatory authorities are well-positioned to drive adoption by supporting the Data Model's use in public infrastructure and frameworks. This includes using the Data Model as a

reference for national registry development or enhancement; encouraging the support and use of the Data Model by private sector or independent market participants; for credits authorized under Article 6, encourage market participants to record and submit the relevant data to jurisdictional policymakers in a standardised format as outlined in the Data Model where possible; and to use the Data Model to inform their disclosure frameworks to improve transparency and comparability.

The first step towards implementation might be to pilot the Data Model in one or more countries, working with both public institutions and private sector actors. Specifically, there are three priority areas to be tested in the pilot phase:

- **The development and use of unique identifiers:** Implementing the proposed approach will require collaboration between registries and policymakers in a willing jurisdiction.
- **Integration with national, private, and independent registry architecture:** Ensuring registries can effectively embed unique identifiers, as well as other standardisation guidelines, into their existing data systems will be critical for encouraging the wider adoption of the Data Model. In the piloting process, it would also be necessary to address, in consultation with regulators and market participants, any concerns on data security, market supervision or otherwise, and adapt the implementation approach accordingly.
- **Incorporation of Article 6 guidance:** Article 6 technical specifications are still evolving and forthcoming and there will be important lessons from countries and market participants to draw on. Additionally, there may be benefits to road testing the current approach to embedding the AEF in the Data Model, and working with the UNFCCC, countries, and other market participants to understand whether the proposed structure for capturing the AEF is effective, or if further integration or simplification would be helpful.

In addition to the three priority areas, the Data Model should be tested as widely as possible by different market participants across different stages of the life cycle. A 12–18-month piloting phase would allow sufficient time to begin to gather learnings and capture feedback across the full reporting cycle and to integrate feedback accordingly. This would also involve updating picklist values and other relevant fields on a regular basis, in response to policymaker and market participant feedback.

The remainder of this Technical Consultative Note is structured as follows:

- **Section 1 provides a brief introduction** addressing the motivation for the G20 SFWG's focus on carbon credit markets in 2025 and recent developments relating to these markets.
- **Section 2 outlines the need for data standardisation** across the carbon credit value chain and lays out the potential role of the Data Model in setting out a globally recognised common approach.
- **Section 3 introduces the Data Model,** laying out the principles that guided its development and the overarching structure and format of the model.
- **Section 4 details the design of the Data Model,** including key design choices related to its structure and to specific data fields.
- **Section 5 describes the levers for voluntary adoption and implementation** of the model, including a proposed piloting phase.
- **Section 6 proposes a potential delivery model** for piloting, maintenance, and future development of the Data Model.

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Section 1: Introduction to Carbon Credit Markets

Under the South African G20 Presidency, the G20 Sustainable Finance Working Group (SFWG) has identified unlocking the financing potential of carbon credit markets as one of its three priorities for 2025.[6] In 2021, the SFWG developed a comprehensive Roadmap for Sustainable Finance, setting out 19 priority action areas including Action 5: to "identify opportunities to promote the scaling up of climate and sustainable-aligned financial instruments, products and markets".[7] Compliance carbon pricing schemes, like emissions trading and carbon taxes, were addressed in the 2022 G20 Sustainable Finance Report, which recognized them as an important tool for mobilising private capital and enhancing cost-effectiveness in emissions reductions when used appropriately in the jurisdictional policy mix.[8] In this fourth year of the Roadmap's implementation, carbon credit markets are being considered as a complementary policy lever, given their potential for scaling finance to support critical mitigation projects. In its 2025 work the G20 SFWG *specifically* aims to contribute to increasing data standardisation in carbon credit markets, supported by the G20 Finance Track's expertise on enabling resilient cross-border financial flows through effective and transparent markets, underpinned by appropriate data, reporting, and infrastructure.

As set out in the G20 SFWG's Note on Priorities (2025), narrowing the climate financing gap will require accessing all potential financing mechanisms, including carbon credit markets. The Independent High-Level Expert Group on Climate Finance estimates that Emerging Markets and Developing Economies (EMDEs) will require US$1 trillion of external climate finance annually till 2030 to enable climate action.[9] A New Collective Quantified Goal (NCQG) was also agreed at COP29, setting an aspiration of mobilising US$1.3 trillion annually in climate finance for developing countries.[10] Delivering on this goal, and achieving broader global climate commitments, will require using all mechanisms at our disposal. Carbon credit markets currently account for a small proportion of investment towards decarbonisation, accounting for approximately US$1.4 billion in 2024.[11] However, with the right underpinnings, including high-integrity supply, credible claims, and market infrastructure that enables transparency, carbon credit markets have the potential to scale and channel investment to critical mitigation projects that are otherwise difficult to finance. This includes nature-based solutions; just energy and industrial transition investments; and developing new technologies, such as carbon removals (Figure 1).

Figure 1: Carbon credit markets can finance decarbonization where the economics are otherwise difficult

[6] G20 Sustainable Finance Working Group: 2025 Presidency and Co-chairs Note on Agenda Priorities (2025).
[7] G20 Sustainable Finance Roadmap (2021).
[8] G20 Sustainable Finance Report (2022).
[9] Grantham Research Institute on Climate Change and the Environment (2024).
[10] UNFCC CMA agenda item 11(a) New collective quantified goal on climate finance (2024).
[11] MSCI: Frozen carbon market may thaw as 2030 gets closer (2024).

Compliance carbon pricing and carbon credit markets can be seen as complementary policy levers for advancing climate action. Compliance carbon pricing systems, including carbon taxes and emissions trading systems (ETS), send price signals to incentivise emissions reductions (see Box 2). These policies are applied at the domestic level to decarbonize a jurisdiction's production systems, typically in the power and industrial sectors.[12] Although historically implemented in advanced economies, compliance carbon pricing is rapidly gaining traction with a growing number of major EMDEs using this lever.

BOX 2: CARBON PRICING

What are compliance carbon pricing mechanisms?

Carbon pricing recognises that greenhouse gas (GHG) emissions impose societal costs, and places a price on the source of such emissions, usually in the form of a price on the carbon dioxide-equivalent (CO_2e) emitted. Instead of directly regulating who should reduce emissions, and how much, a carbon price provides an economic signal to emitters and allows them to decide to either transform their activities and lower their emissions or continue emitting and pay for their emissions. In this way, the overall environmental goal is achieved in the most flexible and least-cost way to society.*

Compliance carbon pricing mechanisms—where emitters are obligated to pay for their emissions—either take the form of a carbon tax (a dollar amount per tonne of CO_2e emitted), or an emissions trading system (ETS). In an ETS, regulators issue a fixed amount of compliance units (allowances) corresponding to a total cap on emissions. Regulated entities (usually companies) must surrender one allowance per tonne of CO_2-equivalent (or CO_2e) GHG emitted. These entities may trade units between them, creating a market and therefore a price for the units.

Per the 2024 World Bank State and Trends of Carbon Pricing report, there are 75 compliance carbon pricing policies in operation globally, covering around 24% of global GHG emissions. Nineteen G20 countries have a carbon pricing policy in operation or under development, either at the supranational, national, or sub-national level.

*Based on definition by the World Bank, What is Carbon Pricing? (2025)

Meanwhile, carbon credit markets facilitate the financing of decarbonisation projects, most frequently but not exclusively in EMDEs, through the creation and transfer of carbon credits. These credits can unlock cross-border finance flows to support mitigation projects in regions where abatement is cost-effective but would not otherwise be economic and to secure the needed finance. Carbon credit markets span four market segments based on the source of demand for credits: (i) international co-operation on climate action between countries through Article 6 of the Paris Agreement (Article 6); (ii) international sectoral crediting schemes like the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which requires airline operators to offset emissions growth through the purchase of carbon credits that meet certain eligibility criteria; (iii) corporates voluntarily purchasing credits through the Voluntary Carbon Market (VCM) to meet climate commitments; and (iv) domestic compliance carbon pricing mechanisms, when countries choose—as a matter of domestic policy—to allow use of certain types and/or quantities of carbon credits within their ETS or carbon tax. Box 3 outlines carbon credit markets in more detail.

[12] Carbon pricing typically applies at the national level, but there are some notable exceptions to this—the European Union's carbon pricing scheme, the EU ETS, applies at the supranational level. Some states in the US and provinces in Canada have sub-national carbon pricing systems.

BOX 3: CARBON CREDIT MARKETS

What are carbon credit markets?

Carbon credit markets are mechanisms that allow entities to purchase tradable units, known as carbon credits, representing a tonne of CO_2e reduced or removed elsewhere. These credits can be used to meet voluntary climate commitments or, in some regulated settings, to comply with specific obligations. They aim to channel finance toward activities that reduce or remove emissions—such as afforestation; just energy and industrial transitions; or carbon removals. Carbon credit markets are complementary to compliance carbon pricing schemes: while ETSs and taxes internalise the cost of emissions, credit markets incentivize additional mitigation efforts beyond jurisdictional regulatory requirements.

Carbon credit markets can be broadly divided into four demand segments:

- **Credit-like approaches for international cooperation under Article 6:** Article 6 of the Paris Agreement allows countries to cooperate by transferring mitigation outcomes (ITMOs) bilaterally (Article 6.2) or through a centralised crediting mechanism governed by the UNFCCC (Article 6.4, now known as the Paris Agreement Crediting Mechanism or PACM). Article 6 allows for a broad range of mechanisms, including approaches that do and do not generate credits.
- **International sectoral schemes:** These include industry-specific schemes like CORSIA established by the International Civil Aviation Organisation (ICAO), which is a specialised UN agency. Under CORSIA rules, regulated entities (i.e., airline operators) must offset emissions growth beyond a baseline through the purchase of carbon credits that meet certain eligibility criteria set by the ICAO Council at the recommendation of their Technical Advisory Body (TAB).
- **Domestic compliance carbon pricing mechanisms:** Countries may choose—as a matter of domestic policy—to allow entities regulated by the mechanism to use certain types and/or quantities of carbon credits within their ETS or carbon tax to satisfy part of their compliance obligation. Policymakers will often place qualitative or quantitative restrictions on credits that may be used for compliance purposes.
- **The Voluntary Carbon Market (VCM):** Entities (typically corporations) purchase carbon credits to meet voluntary mitigation commitments, including net-zero targets and climate-neutrality claims. These markets are unregulated but guided by voluntary independent standards such as Verified Carbon Standard (Verra) or Gold Standard.

Estimates of the role and potential size of carbon credit markets vary, but the UN Independent High Level Expert Group (IHLEG) on Climate Finance estimates that these markets could channel upwards of US$50 billion in debt-free climate finance to EMDEs by 2030. (IHLEG on Climate Finance 2023: A climate finance framework: decisive action to deliver on the Paris Agreement).

The Data Model being delivered to support the G20 SFWG's Priority 3 focuses on carbon credit markets; it does not take a view on compliance carbon pricing mechanisms. The Data Model does not seek to capture other forms of bilateral cooperation under Article 6, nor does it seek to influence any substantive policy decision on the eligibility of credits for carbon pricing schemes—both these use cases are firmly out of its scope (see Section 2.2 for more detail).

Section 2: Benefits of Data Standardisation

This section outlines the case for data standardisation across carbon credit markets (Section 2.1) and then introduces the draft Common Carbon Credit (CCC) Data Model that has been developed to support the G20 SFWG's 2025 carbon credit market priority, including its scope (Section 2.2), and intended benefits and use cases (Section 2.3).

2.1 Benefits of data standardisation along the carbon credit life cycle

Over the past decade, significant progress has been made in developing carbon crediting frameworks as a mechanism for international cooperation on climate action. The Paris Agreement, adopted by 196 Parties at the UN Climate Change Conference (COP21) in December 2015, established the foundation for such cooperation through Article 6, which enables the international transfer of emissions reductions and removals to help countries achieve their climate goals. The operational rules for Article 6, including a framework for bilateral cooperation under Article 6.2, was agreed through international negotiations at COP26, COP27, and COP29. This framework encompasses a broad range of voluntary cooperative activities that can generate tradable mitigation outcomes, including policy-based crediting, renewable energy, and transport or infrastructure projects. In parallel, progress was made on Article 6.4, which establishes a centralised mechanism for crediting mitigation activities overseen by the UNFCCC, which is now referred to as the Paris Agreement Crediting Mechanism (PACM). The Article 6.4 Supervisory Body has adopted guidance on baselines and additionality standards and additional work is underway to develop a registry and supporting infrastructure.

Alongside these UNFCCC-led cooperative mechanisms, sectoral and market-based initiatives have evolved to meet growing demand to scale mitigation supported by the necessary finance. CORSIA, established by ICAO, represents the first global sectoral crediting market with mandatory offsetting rules, requiring airline operators to offset a portion of their emissions growth using eligible carbon credits. The VCM—driven by private sector climate commitments and demand for high-integrity carbon credits—has been in operation in some form since the early 1990s. This market has developed largely organically, without centralised oversight, involving a diverse set of actors along the life cycle, including: project developers; third-party verifiers; registries; specialised rating agencies; brokers; marketplaces; exchanges; and corporate buyers. The VCM has started to play a role in channelling finance to important mitigation activities, particularly in EMDEs, but concerns around the environmental integrity of credits, as well as heterogeneous standards and operational models, among other things, have prevented the VCM from reaching its full potential to deliver cross-border finance.

Efforts to address these challenges, particularly to raise standards on the supply side, are now starting to support increased confidence in the market. Over the last few years, the work of the Integrity Council for the Voluntary Carbon Market (ICVCM) has supported global indicators for high-integrity credits against which carbon crediting programmes and credit methodologies are being assessed.[13] Several efforts are being made to stimulate demand and to support companies to make credible carbon credit claims.[14] It is important to continue this work to raise supply and demand standards so that the VCM adheres to good practices expected in other markets. Increasingly, the focus is turning to issues of market infrastructure, with a focus on transparency and standardisation—including on data being collected and reported, as well as legal and accounting treatments and wider market development and infrastructure.

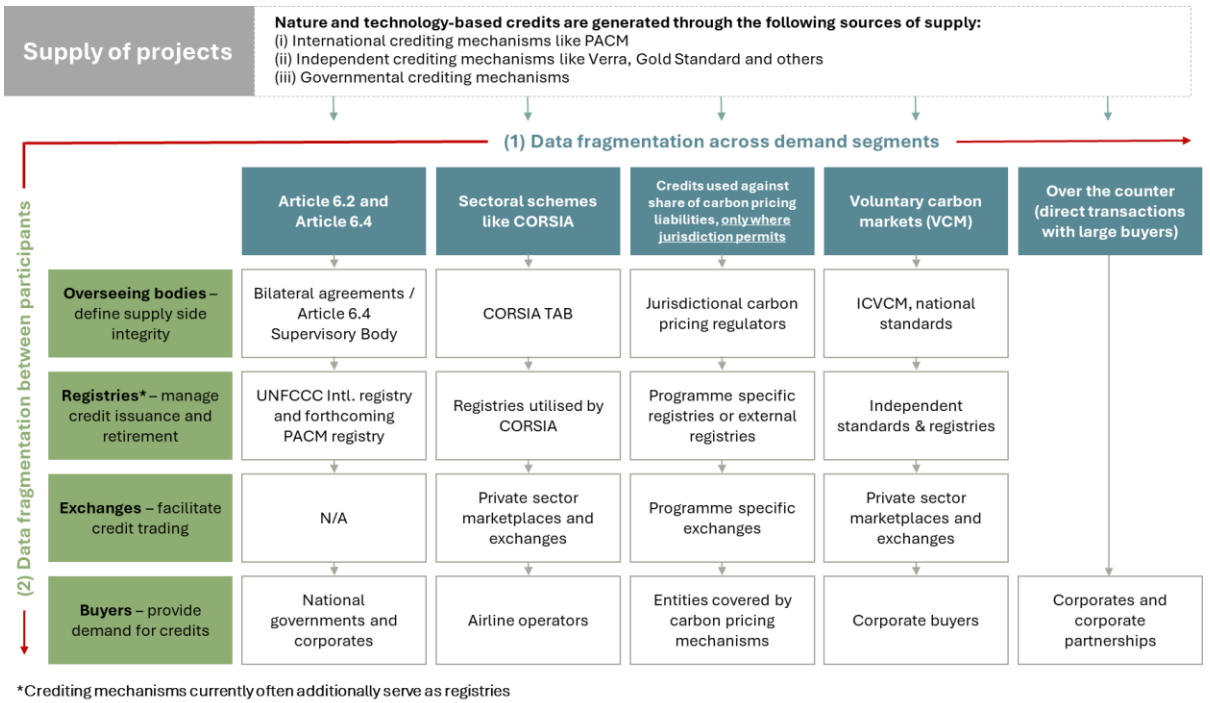
Indeed, existing data practices in carbon credit markets may be hindering effective market functioning. The International Organization of Securities Commissions (IOSCO) found that one of the key vulnerabilities of the current voluntary carbon market relates to "data availability, accessibility, and general

[13] Integrity Council for the Voluntary Carbon Market.
[14] Including the work of the Voluntary Carbon Markets Integrity Initiative (VCMI), World Bank and IOSCO.

lack of transparency in the market".[15] Furthermore, a Nasdaq study, which surveyed over 130 market participants, found that "price transparency, market inefficiencies, and fragmentation remain critical structural barriers to scale".[16] The World Bank Carbon Markets Infrastructure Working Group's Technical Guidance Note on Enhancing Data and Systems Interoperability for Carbon Markets states that "carbon markets currently face significant data fragmentation, with inconsistencies and a lack of standardization across data sources, registries, and reporting standards. This fragmentation—resulting from differing data models, diverse methodologies, incompatible systems, and varying levels of technological adoption—often isolates essential data, such as verification of mitigation outcomes, ownership, and emissions reductions. Siloed information and the lack of a globally recognized common approach complicate efforts to promote transparency and accuracy in tracking carbon credits".[17]

Data fragmentation and a lack of data standardisation arises for several reasons, including: (1) *vertically* between the market participants involved at each stage of the credit life cycle within a particular market segment and (2) *horizontally* between the different carbon credit market demand segments (Figure 2). More specifically, along the life cycle, market participants at each stage—from project developers to buyers—use different norms and systems to record and store data. For example, in voluntary markets, a carbon credit project may be assigned a unique identification number by a registry when it is first registered. However, as the credit progresses across the life cycle from issuance to trading and retirement, it may be assigned several different identifiers in different formats by marketplaces or exchanges. This vertical fragmentation is compounded by horizonal fragmentation, i.e., differing practices between carbon credit market demand segments—such as the Article 6 market, CORSIA, and the VCM—which can all draw on the same pools of underlying projects, but operate with different rules, methodologies, registries, and also data and reporting systems. At the aggregate level, incompatible data systems and inconsistent data standards and protocols mean that it is difficult to aggregate, exchange, and integrate data across and within these markets.

Figure 2: Fragmentation in carbon credit markets



[15] IOSCO: Voluntary Carbon Markets (2024).
[16] Nasdaq: Scaling Today's Carbon Markets: A New Market Blueprint for 2024 (2024).
[17] World Bank: Technical Guidance Note on Enhancing Data and Systems Interoperability for Carbon Markets: Current Landscape and Strategic Recommendations (2025).

Taken together, the challenges around data fragmentation and a lack of data standardisation along the carbon credit life cycle and between market segments can have several real-world costs that hinder the ability of carbon credit markets to reach their full potential in terms of supporting carbon mitigation. Examples of these consequences include:

- **National and sub-national policymakers:** A lack of data standardisation can make the process of setting up a maintaining registry for national and sub-national emissions accounting and reporting more complex, creating considerable administrative burden in compiling and aggregating disparate sources of data. Without unique identifiers it is difficult for policymakers to ascertain the provenance of projects and track credits across the lifecycle and ecosystem; this elevates double counting risk. Administrative delays in processes involving these registries may then have knock-on effects on credit development timelines, hampering access to finance or resulting in increased costs for project developers.
- **Market service providers:** For market service providers, the ability to provide the breadth and depth of services seen in more mature markets—including trading of standardised instruments on exchanges, specialised rating services, and provision of market analytics—will be hampered by data availability and quality issues. This explains, in part, why private sector participants have been trying to address these data challenges, notwithstanding the challenges of so doing bottom-up. More generally, data issues are likely to significantly hamper the fair and efficient operation of a secondary market and this lack of liquidity also impacts demand and pricing.
- **Investors:** For investors, including multilateral development banks (MDBs) and sophisticated financial institutions operating in highly regulated environments, the ability to provide the long-term capital needed to scale the market could be constrained due to the poor availability and quality of data needed to perform due diligence. This includes data needed to make environmental integrity and financial assessments of individual credits and to benchmark them against credits with similar characteristics.
- **Buyers:** For buyers, the challenges around obtaining sufficient high-quality data to identify and benchmark credits meeting the characteristics they are looking for, informed by their mitigation needs and preferences, are very likely to dampen demand (and prices). Data quality also impacts buyers seeking to meet disclosure expectations and requirements. Only the largest or most committed companies are likely to be able to consider overcoming data challenges through their own due diligence directly or by contracting third party intermediaries, and even for them this pushes up costs.
- **Project developers:** Project developers often record project development documentation (PDDs) following a template provided by registries, and set up their data systems to align with these PDDs. This may create a barrier to switching to another registry.

A globally recognised approach to data standardisation can support traceability and comparability of credits, and greater interoperability across carbon credit market data systems. A common data model could improve carbon credit market functioning in a specific but important way. It is clear that data standardisation alone cannot solve all the challenges carbon credit markets are facing. That will require continued work—in parallel—by a broad set of stakeholders.

The engagement by the G20's SFWG to support data standardisation is well timed, given several practitioner-led initiatives in this space. A few initiatives have made important progress in identifying data and market infrastructure challenges that affect specific user groups, and in some cases these initiatives have developed or are developing in-depth resources on data standardisation for selected parts of the carbon credit life cycle.[18] The Data Model developed to support G20 SFWG Priority 3 is intended to be a resource that complements existing resources in three key aspects: First, it is broad in terms of stages of the life cycle covered—including all stages from project development to credit retirement—but less granular than other practitioner-led initiatives, covering only the minimum foundational data fields required to enable interoperability between carbon credit market participants' data systems and cross-border trade.

[18] Other practitioner-led initiatives include the CAD Trust and Carbon Open Data Protocol (CDOP).

This makes it suitable as a common foundation for other initiatives to build on. Second, because of this end-to-end coverage, it is well placed to introduce a system of unique identifiers for projects and credit batches common to all market participants (see Section 4.2.1 for more detail on unique identifiers). Third, it has benefitted from engagement with policymakers, specifically the G20 SFWG, which brings deep financial sector expertise, and the UNFCCC Secretariat to ensure it is aligned with internationally negotiated outcomes under Article 6.

2.2 Role and scope of the Data Model

2.2.1 What the Data Model does and does not do

In general, data models are tools that act as a blueprint for how information is categorised, organised, and recorded within data systems. They set out guidelines for what data is to be collected (i.e., what fields), how that data is structured (e.g., a single table, multiple tables that can be mapped to each other) and what format they are captured in (e.g., are they freeform text, are they picklist values). Without a common data model, different actors collecting and recording similar information may do so in inconsistent ways, making exchange, integration, aggregation and analysis difficult, requiring manual intervention that is prone to error. Inconsistencies make linking systems or sharing information challenging and, additionally, render data collected by different actors difficult to compare and aggregate. Markets that have standardisable characteristics—including carbon credit markets—can be made more efficient using a common data model.

The Data Model being developed to support G20 SFWG Priority 3 identifies the core data fields that are important for market participants across the carbon credit life cycle and makes recommendations on suggested approaches to standardise these fields, including naming conventions, descriptions, encodings, data and unit types, and, in some cases, predefined values.

It is intended that the Data Model be an accessible, practical common foundation for data standardisation across the carbon credit life cycle, for voluntary adoption, with the overriding aim of supporting increased data standardisation cross carbon credit markets. The Data Model is intended as a resource that helps to address existing standardisation issues, empowering those policymakers and market participants seeking to develop approaches and infrastructure to support the effective flow of credits and data between market participants. It would be a freely available resource, in an accessible format, and could be innovated and built on by market participants and policymakers.

In practice, this means the Data Model will be delivered as a single spreadsheet, with the following characteristics:

- A set of data tables related to different stages of the carbon credit life cycle; there will be recommendations regarding data fields to be collected and descriptors to facilitate a common understanding of each field.
- Standardised formats for those fields where possible, through data field names, encodings, specific data and unit types, as well as predefined picklist values and indicators.
- A data entity diagram showing an illustrative relationship between different tables, as well as primary and/or reference keys for linking or aggregating them.

The Data Model itself does not serve as a database, impose requirements to build registry infrastructure, or report data fields, nor is it a substitute for integrity assessments. Each of these considerations has been addressed below:

- **The Data Model is not a database.** In other words, the SFWG deliverable will not collect and store actual data from actors in the carbon credit life cycle or make this available and searchable to the

public. Therefore, it will not interfere with proprietary data or existing privacy and security arrangements.

- **The Data Model does not impose requirements to build registry infrastructure.** The SFWG recognises the heterogeneous needs of different registries—jurisdictional, independent, and private sector—and that each market participant will build systems that are appropriate to its needs and resources. The Data Model is deliberately designed to be technology agnostic. It suggests an approach to standardising and recording critical data fields that can be implemented in existing market infrastructure.
- **Recommendations would not be made on whether specific fields should be made publicly available, or more generally on disclosure requirements for carbon credits.** While the value of transparency in the carbon credit market is recognised, assessing which fields could be made freely available and accessible to the public is out of the scope of this deliverable and could be considered in future work.
- **The Data Model is not intended as a substitute for environmental integrity assessments.** On the supply side, independent standards and regulation continue to play a critical role in ensuring that carbon credits deliver the benefits they claim, while on the demand side, policymakers and voluntary demand side standards would need to regulate use cases for carbon credits and what claims can be made against them.

2.2.2 Scope of the Data Model

It is intended that all carbon credits are in scope of the Data Model. However, there are important caveats related to both Article 6 of the Paris Agreement and the broader interaction with regional, national, and sub-national carbon pricing schemes that limit the scope of the Data Model in important ways (illustrated in Figure 3). After COP29 in Baku, there is greater clarity on the rules governing Article 6.2 and 6.4 respectively.[19] Because the mechanisms have different reporting requirements, it is instructive to address them separately.

The standardised reporting fields for bilateral agreements under Article 6.2 are fully captured by the Data Model. These fields primarily relate to the authorisation status of internationally transferred mitigation outcomes (ITMOs) and national emissions accounting, rather than to the carbon credit life cycle (the Data Model's primary scope). Article 6.2 ITMOs are not limited to carbon credits and can encompass a range of bilateral cooperation activities, including credible policy actions resulting in emission reductions. The Data Model is only relevant in cases where carbon credits, generated through processes comparable to the voluntary market or CORSIA, are authorised for use under Article 6.2. In these cases, the Data Model fully incorporates and replicates the UNFCCC's Agreed Electronic Format (AEF) tables and would provide a guide for how Parties can supply the required information to UNFCCC.[20]

The Data Model does not yet capture data requirements for Article 6.4 as these are not yet available—but it would be updated to do so when these are finalised and the mechanism's registry is operational. The Article 6.4 decision at Baku established the Paris Agreement Crediting Mechanism (PACM) and provided guidance on methodologies and technical aspects, including removals. The PACM Registry is currently being built—but, unlike Article 6.2, as yet there is no recommended reporting format for the mechanism. To avoid taking a position on these requirements before they are finalised by the Article 6.4 Supervisory Body, the current draft of the Data Model does not include fields specific to Article 6.4. It is recognised that in the future the Data Model will require updating to account for these, as discussed in

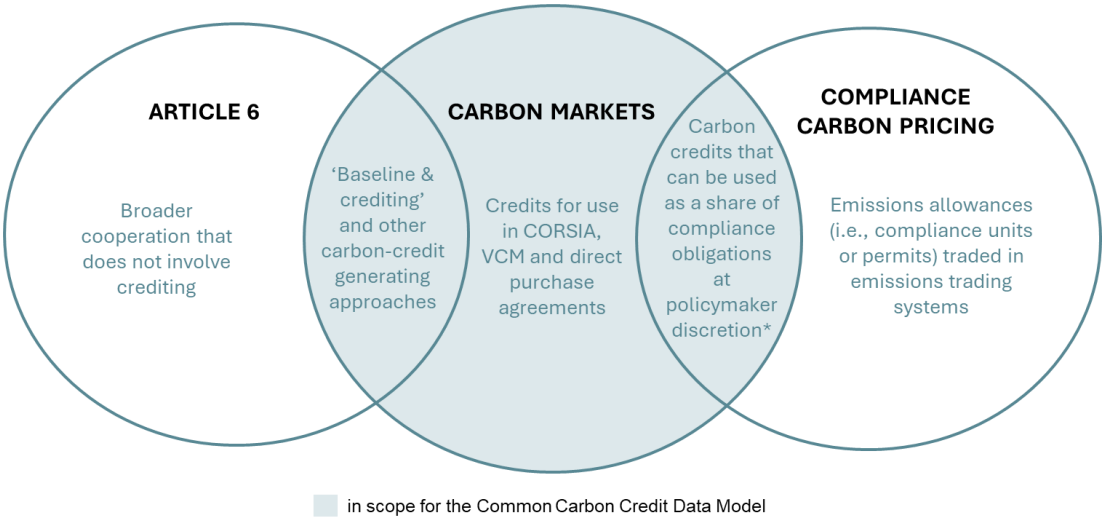
[19] See Decision 15a, and 15b, CMA.6, COP29 (2024).

[20] While the Article 6.2 guidance has set out, explicitly, recommended fields for Parties to report, the full registry infrastructure is still being built. This means that the UNFCCC Secretariat, in building the registry, has some discretion to adapt and update the AEF before its full technical requirements become available. The draft of the CCC Data Model therefore faithfully reflects the latest AEF for Article 6.2, but may require refining in the future if the AEF changes. This is addressed in Section 5 on governance.

Sections 5 and 6. Analogously, with regard to Article 6.2, only carbon credits with standardisable characteristics transacted through the PACM would be in the scope of the Data Model.

Finally, any emissions allowances traded within regional, national, and sub-national carbon pricing mechanisms—as well as substantive policy decisions on whether credits are permitted to be used for compliance obligations under those mechanisms—lie squarely in the remit of policymakers and are out of scope for the Data Model. Where credits with specific characteristics have been deemed eligible for use against the compliance obligations of a specific jurisdiction, the Data Model will recommend assigning standardised eligibility labels to those credits to recognise the choices policymakers have made (see Section 4.2.8). Additionally, Section 6 sets out governance proposals to guard against the misapplication of these labels and to ensure robust governance of the Data Model more generally.

Figure 3: The Scope of the CCC Data Model



* Note: This refers to carbon credits that policymakers have deemed eligible for use in compliance carbon pricing mechanisms as a share of carbon tax obligations, or in lieu of some portion of emissions trading system compliance units called emissions 'allowances'

2.3 Benefits and use cases

Wide voluntary adoption of the Data Model by market participants, underpinned by signalling on its value from policymakers, would help address both horizontal and vertical data fragmentation in carbon credit markets. Vertically, market participants recording information following a consistent approach, as set forth in the Data Model, would allow for greater interconnection and easier exchange of information throughout the market. For example, all registries using the same unique project identifier format would enable exchanges and other credit marketplaces to more easily track these projects and curate information on them for buyers. Data providers and specialised rating agencies would face fewer frictions related to aggregating and analysing data, resulting in richer market insights. Figure 4 below illustrates additional use cases for different market participants. Horizontally, between different carbon credit market segments, the Data Model would provide a consistent set of approaches to standardising data, enabling greater interoperability between carbon credit data registries and reducing administrative costs for credits that meet underlying eligibility requirements to be sold across multiple market segments.

The Data Model could also make setting up national and sub-national registries easier and more efficient, while strengthening the environmental integrity of emissions accounting. The Data Model can provide a minimum framework for policymakers to build on, streamlining decision making on registry design, and promoting alignment across jurisdictions that choose to adopt it. Integrating unique identifiers would further strengthen the environmental integrity of emissions accounting in registries, particularly in

scaled-up approaches where multiple credit-generating projects may be nested within a single jurisdictional or sectoral approach—conditions that could introduce complex accounting challenges and elevate the risk of double counting. Assigning unique identifiers to each project and credit batch would enable automatic detection of duplicates across registries, mitigating risks of reissuance and overlapping claims. With over US$4 billion in REDD+ finance committed to emerging and developing economies, ensuring accurate and transparent emissions accounting will be essential to maintaining market confidence and enabling the sustained growth of these approaches.[21]

More broadly, use of the Data Model would help to ensure participants are all 'speaking the same language', improving market functioning, and enabling buyers to transact more easily. This reduces transaction costs for buyers and allows them to buy at scale. For example, buyers could enter and navigate the carbon credit market more seamlessly and confidently if they could identify credits with similar characteristics relevant to their needs (e.g., from a certain sector, risk profile, or eligible for compliance use in a particular emissions trading system) and make apples-to-apples comparisons of credits knowing the underlying data has been standardised.

However, it is important to recognise that there are some initial time and resource costs associated with investing in data standardisation and these costs would fall primarily to carbon credit registries. Market infrastructure providers, primarily registries, typically bear the greatest burden of implementation, while the benefits of standardisation are dispersed across the broader market. The provision of standardised data represents a public good that is likely to be undersupplied without active support and coordination from governments and standard-setting institutions. To ensure the Data Model's success, registries must be adequately consulted and supported, so that the value of standardisation is appropriately balanced against its operational costs. This consultation process is central to identifying how the Data Model can strike this balance, and support all stakeholders.

Figure 4: Illustrative Use Cases for the CCC Data Model

USER GROUPS	ILLUSTRATIVE BENEFITS AND USE CASES
UNFCCC	• Use of the Data Model to capture Article 6 fields could support dissemination of the AEF (and any other) guidance and integration into market participant systems • Use of the Data Model would facilitate standardisation of additional carbon credit life cycle data fields shared with the UNFCCC (where credits are transacted through Article 6)
National policymakers	• Unique identifiers* enables tracking of projects and credits, which (i) protects against double counting, improving national & sub-national mitigation accounting and (ii) supports integration with financial market infrastructure to scale cross-border flows • The Data Model could be used to inform the design and standardisation of disclosure frameworks (at policymaker discretion)
Credit buyers	• Greater standardisation and comparability of data would enable buyers to more easily (i) identify relevant credits (for example, in a specific sector or jurisdiction) and (ii) conduct integrity assessments and benchmarking of credits • Increasing ability of identifiers to integrate into financial markets might support a more effective trading infrastructure, bolstering the development of a secondary market
Project developers	• The Data Model could enable more standardised formats for project design documents (PDDs), reducing friction and processing times for project registration and potentially increasing competition between registries to meet developer needs • Data standardisation across market segments and jurisdictions could result in increased ability to supply more than one market segment and increase cross-border flows
Standard setters and registries	• The Data Model would enable real-time data harmonisation and integration across registries and other market participants like exchanges, supporting market liquidity • Unique identifiers would support easier tracking of projects and credits across registries
Data providers and ratings agencies	• Standardised formats would enable easier aggregation and analysis of carbon credit data • Should policymakers use the Data Model to inform disclosure frameworks, data on corporate carbon credit use would be more streamlined, supporting transparency and analysis
Other intermediaries	• Unique identifiers* that can be integrated into financial markets infrastructure might support more effective trading infrastructure and secondary market, supporting market liquidity and price discovery

**Note: Unique identifiers refers to globally recognised common identifiers as proposed by the Data Model (see section 4.2.1)*

[21] The US $4 billion financing amount includes the US $1 billion mobilised by the LEAF coalition, US $750 committed by Hess Corporation to Guyana for 37.5 million ART-TREES carbon credits by 2032, and US $2 billion committed by Mercuria to the state of Tocantins in Brazil for 40 million ART-TREES carbon credits between 2016-2020, with a commitment to purchase credits through to 2030.

Section 3: Introduction to the Common Carbon Credit Data Model

This section introduces the Data Model, describing the principles guiding its development (Section 3.1) as well as laying out its format and structure (Section 3.2).

3.1 Principles and approach guiding Data Model development

The development of the Data Model has been guided by a set of high-level policy principles designed to ensure it helps deliver public good outcomes. These principles were developed and refined in discussion with the G20 SFWG and CDSC's PWG. The principles suggest that an effective data model for carbon markets should:

- **Be delivered as a public good:** The data model should be transparent and openly accessible to all—serving as a common foundation that captures the core data fields to be standardised and can be built upon by policymakers, other practitioner-led initiatives, and wider stakeholders on a voluntary basis.
- **Consider the entire carbon credit life cycle:** The data model should cover the entire carbon credit life cycle, providing a voluntary common foundation for all market participants. This would ensure that all market participants from project developers to registries to exchanges can record data in a way that is interoperable across their respective systems.
- **Incorporate best practice from financial markets:** The data model should facilitate cross-border flows by improving data infrastructure—including, but not limited to, developing unique identifiers which, like ISINs in financial markets, support traceability and trading of carbon credits across borders. The Data Model aims to learn from the successes of financial markets in this respect, but it is not suggesting that credits should be treated (and regulated) as financial instruments.
- **Employ accessible technology:** The data model should be presented in an accessible format—for example, in spreadsheet format—such that market participants and policymakers do not face technology-related barriers to using the resource.
- **Respect policymakers' sovereignty:** The data model should be a resource for voluntary adoption to support data standardisation and it should not impede policymakers from developing their own jurisdictional views on policy including (but not limited to) the relationship between carbon markets and carbon pricing mechanisms; the regulatory treatment of carbon credits (by financial regulators or otherwise); and disclosure rules.
- **Align with negotiated multilateral outcomes:** The data model should align with internationally agreed outcomes negotiated at the Conference of Parties (COP). It should be respectful of the UNFCCC's processes, integrating and supporting dissemination of Article 6 reporting guidance.

The development of the Data Model followed a consultative approach with the SFWG and the CDSC PWG, and this current draft of the Model benefitted from engagement with several stakeholders. Engagement with the UNFCCC Secretariat supported alignment of the Data Model with suggested reporting requirements for Article 6.2. A review and mapping were undertaken, where information was available, of common data fields across several existing publicly available data models, as well as the approaches taken to specifying those fields. Discussions were had with initiatives that have undertaken, or are planning, relevant work in this regard, including the World Bank's Carbon Markets Infrastructure Working Group (WB CMI WG), the Climate Action Data (CAD) Trust, the Climate Data Open Protocol (CDOP), and the ICVCM.[22] The intent to develop the Data Model was brought to the attention of a broad set of market participants—both mature and emerging participants across the carbon credit value chain

[22] The CDSC Secretariat is an observer to WB CMI WG, ICVCM Continuous Improvement Work Program on Market Transparency, Scalability and Standardisation and CDOP.

including, but not limited to: project developers; validation and verification bodies (VVBs); registries; exchanges; ratings agencies; and data providers. Participants in both Advanced Economies and EMDEs were engaged to provide initial feedback on: where data standardisation could be helpful across the carbon credit life cycle; if further transparency on data fields is needed; as well as how a common approach could be effectively implemented. Feedback was also sought from the jurisdictions and international organisations that formed the CDSC's PWG and through discussion with the SFWG as a group.

The development of the Data Model is intended to be an iterative approach, and additional feedback from market participants, policymakers, international organizations, and other stakeholders is welcome and necessary. All stakeholders are encouraged to participate in the public consultation process as set out on the G20 website.

3.2 Format and structure of the Data Model

This section describes the three key features of the Data Model:

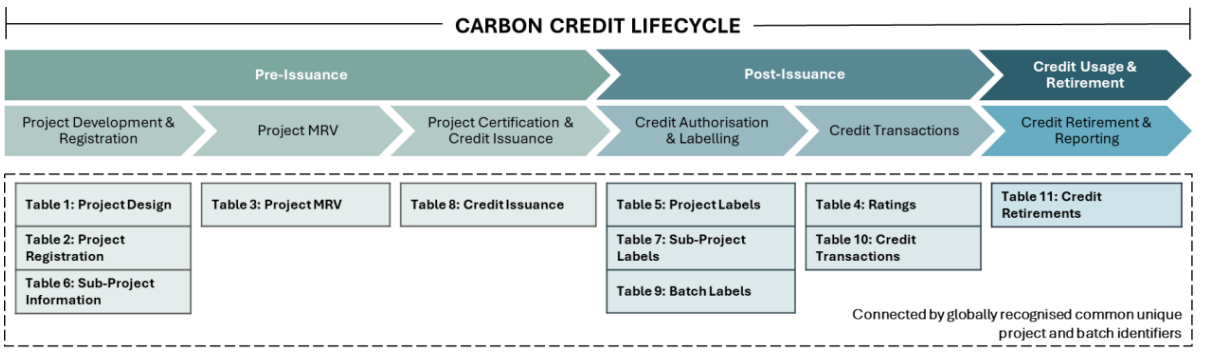
- **It identifies a common set of foundational data fields across the carbon credit life cycle** (further described in Section 3.2.1);
- **It provides suggested approaches to standardising these fields** (further described in Section 3.2.2); and
- **It is made available in an accessible, technology-agnostic format with an illustrative relational schema** (further described in Section 3.2.3).

The full Data Model in spreadsheet format is accessible here on the G20 website. The data entity diagram, illustrating each table and the data fields included within each table, is provided in Annex A.

3.2.1. Identifies a minimum baseline of data fields across the carbon credit life cycle

The Data Model contains suggested data fields organised across 11 tables, a structure that broadly reflects stages in the carbon credit life cycle from project design and development to credit issuance, transactions, and ultimately retirement (see Figure 5 for an overview and Annex B for a detailed list of fields).[23] In determining what data fields to include, consideration was given to striking a balance between seeking to be comprehensive of critical data fields along the entire life cycle across credit types, while ensuring that the Data Model remains proportionate and reflects a common foundation, thereby providing something consistent that others can build upon.

Figure 5: Data Model structure mirroring carbon credit life cycle



[23] Excluding eligibility labels brings the number of suggested data fields in the Data Model down to 80. These eligibility labels are data fields that indicate, factually, whether a project or batch of credits is eligible for use within a specific carbon pricing mechanism based on eligibility criteria set by policymakers governing that mechanism. The Data Model includes 49 eligibility labels, each one corresponding to a compliance system currently in operation that allows the use of carbon credits.

3.2.2 Provides suggested approaches to data standardisation across the carbon credit life cycle

The Data Model supports a standardised approach and provides suggested formats for recording the data fields identified as foundational through the inclusion of data field descriptions, names, encodings, data and unit types, and picklists. Metadata and indicators to reflect whether data is static or changing have also been included to illustrate common data management best practices. In determining the extent to which data fields could be standardised, consideration was given to striking a balance between the usefulness of standardising fields for market participants (e.g., through picklist values), while maintaining the need for flexibility in some cases. Existing approaches to data standardisation in publicly available data models—such as the CAD Trust—were also considered and utilised to the greatest extent possible to reduce fragmentation.[24]

For each data field, the Data Model suggests a standardised approach to how the information should be captured including:

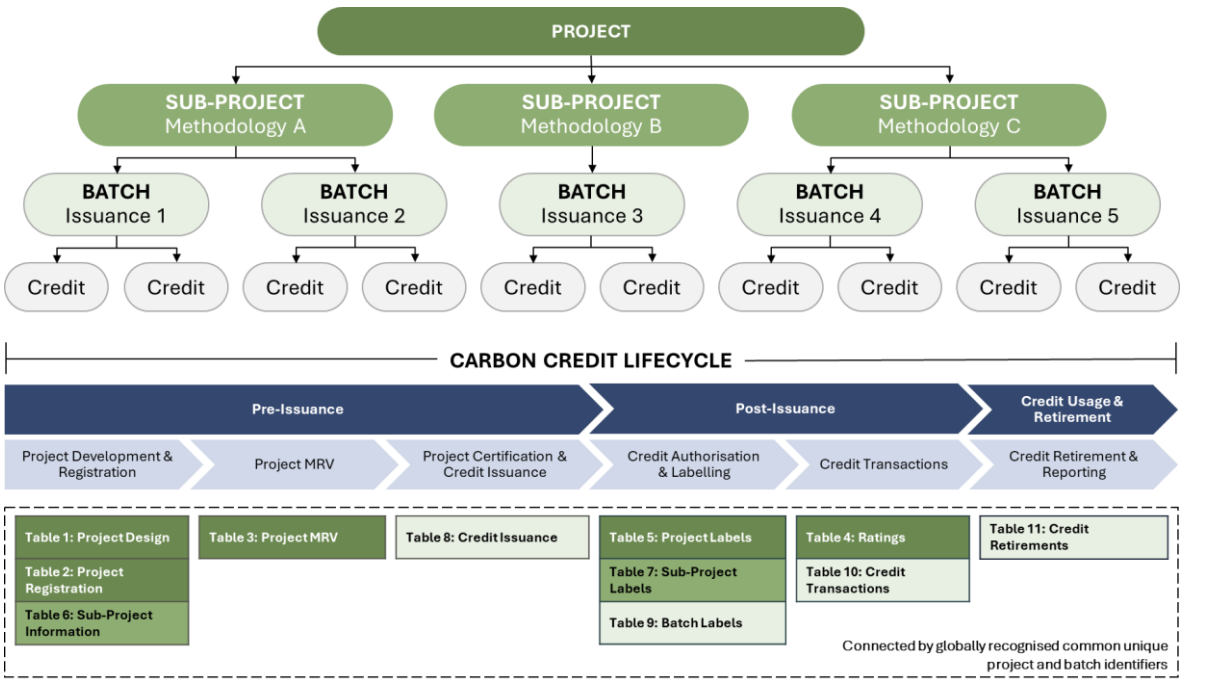
Standardisation Suggestion	Description	Example
Data field names	Naming conventions for each data field	Project Identifier
Encoding	Short-hand name for data fields, used in technical implementation	projectId
Data field description	Short description of each data field	Global unique identifier for the project
Data type	Data types used to record each data field, based on PostgreSQL data types	varchar
Unit type	Unit of measurement where appropriate	N/A (because it is text)
Key status*	Illustrative indicator for whether a data field represents a primary or reference key	Primary key
Static or changing	Indicator for whether a data field should remain permanently static once recorded or can change over time	Static
Picklist	List of predefined values that can be used to describe a data field	N/A (because there is no pre-defined list of unique identifiers)
Notes	Additional information to help support understanding and technical implementation of the suggested approach	"Project Identifier refers to the global unique identifier for a project. The following format is proposed: CBTH1234, with CB representing [...] etc"

**Note: Tables in the schema can be mapped to each other via primary and reference keys. This is further explained in Section 3.2.3.*

[24] This version of the Data Model considers version 1.0 of the CAD Trust data model. Approaches taken in version 2.0 will be considered for inclusion into future iterations of the Data Model.

Depending on the data table, each row in a table might represent a project, sub-project, a batch of credits, or an event, as illustrated in Figure 6. A *project* refers to a carbon credit generating project designed to reduce, or remove GHG emissions. A project may use more than one crediting methodology—for example, a single project may reduce emissions from traditional cooking methods that burn wood or charcoal by (i) providing more efficient stoves ('energy efficiency' methodology) or by (ii) helping households transition to different fuels altogether ('clean cookstoves' methodology). In such cases, the project is split into *sub-projects*, each with a unique methodology. A *batch* represents a group of credits issued together in a single issuance event (for example, the project might issue 100 credits under the energy efficiency methodology in the same crediting period). Many consider credits within a specific batch to have similar characteristics, as they have undergone the same validation and verification process based on the methodology selected. An *event* is an occurrence of an action and can apply to projects, sub-projects, or batches. Examples include the validation of a credit by a certified validation and verification body (VVB) or the retirement of a credit.

Figure 6: Projects, sub-projects, batch and credit hierarchy



3.2.3. The Data Made is made available in an accessible, technology-agnostic format with an illustrative relational schema

The Data Model is made available as an Excel workbook to maintain accessibility. Excel was chosen to ensure the Data Model remains accessible to a broad range of users and to support different implementation approaches, including varying database tools or distributed ledger technologies. In so doing, the Data Model seeks to be technology agnostic to make its benefits available to the widest number of users, even though it is well recognised that some jurisdictions and market participants will chose to make use of sophisticated technology, such as distributed ledger technology.

The Data Model is set out in an illustrative relational schema that shows that each table can be mapped to others through certain data fields called 'keys'.[25] More specifically:

- **One-to-one relationships are used when mapping tables at the same level of granularity.** Primary keys are data fields that are unique in a certain table. For example, in a project-level table like Project Design, the project identifier serves as a primary key, whereas in a sub-project level table like Sub-Project Information, the batch identifier is the primary key. Tables at the same level of granularity can be linked one-to-one based on matching primary keys.
- **One-to-many relationships are used when linking tables of different levels of granularity.** Linking tables of differing granularity can be done by linking a primary key from a higher-level table to a reference key in a more granular table. Crucially, the same data field serves as a primary key in one table and a reference key in the more granular table. For example, *projectId* is unique for every row in the Project Registration table (primary key). However, *projectId* will be repeated in several rows in a table like Sub-Project Information (here it is the reference key).

The relational schema (illustrated in Figure 7) outlines the following categories of tables:

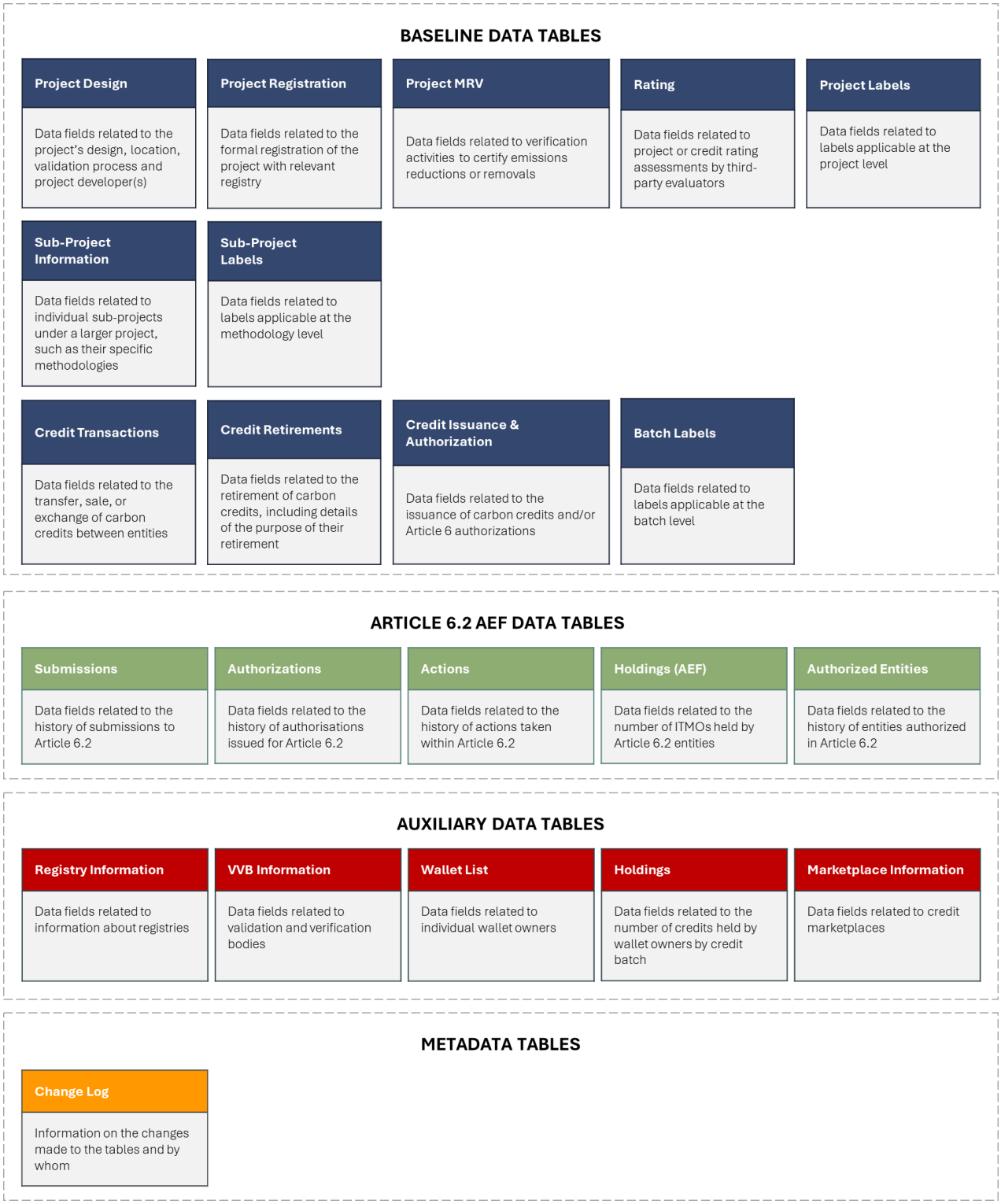
- **Baseline (blue tables).** This includes all the tables discussed above. They represent the common foundational data fields across the carbon credit life cycle and are the core of the Data Model.
- **Article 6 AEF (green tables).** These tables represent data fields in the Article 6.2 Agreed Electronic Format to support market participants that are required to report into the International Registry (i.e., where credits are transacted through Article 6.2).
- **Auxiliary (red tables).** These illustrative tables represent auxiliary information that is considered out of scope for the Data Model, but that nonetheless could be relevant to carbon credit market participants should they wish to collect this information. These tables contain information on registries, verification bodies, and credit marketplaces. A wallet table—which provides information on buyers and sellers of credits (e.g., unique identifier of buyer, name of buyer, country of buyer, etc.)—is also included to demonstrate that further information could be collected where deemed useful. Similarly, a holdings table that could track the quantity of credits of each batch held by market participants is provided for illustrative purposes.
- **Change log (orange table).** This represents illustrative metadata that is suggested to be recorded by market participants to support understanding, transparency, and auditability of data fields.[26]

These categories are illustrated in Figure 7 below. The detailed relational schema, illustrating each table and the data fields within it, is provided in the data entity diagram in Annex A.

[25] A relational schema stores data in structured rows and columns that enable users to easily aggregate and query data. Luna Modeler was used as the relational database management system; it supports (Postgre) SQL as the backend code.

[26] Metadata refers to contextual information about data points, such as who entered a value or under what conditions. Market participants are likely to capture significantly more metadata and different types of metadata than listed in this change log, depending on their systems and use cases.

Figure 7: Categories of Tables Outlined in the Data Model



Section 4: Design of the Common Carbon Credit Data Model

This section outlines the following categories of design decisions:

- **Structural design decisions (Section 4.1)** relating to the set-up of the model, including promoting data normalisation while accommodating multiples, the use of picklist values, and treatment of Article 6-related variables.
- **Data field-related design decisions (Section 4.2)** setting out questions specific to the design of important data fields, including the proposed design and approach to unique identifiers.

4.1 Structural design decisions

4.1.1 Data normalisation and approach to multiples

Challenge: The Data Model is designed to support structured, machine-readable data and is designed around the principle of data normalisation, which requires that every cell have a unique value, and every record be unique wherever possible. However, within a given project, there may be data fields that require capturing multiple values.

There are clear benefits to requiring a unique value for each field and minimising the amount of free-form text in the Data Model so that variables can be recorded in structured, machine-readable formats. Requiring a unique value reduces redundancy and supports usability, which is further enabled by minimizing free form text. The benefits of this approach include error minimisation (for example, stray spaces or typos in entries of fields), smoother querying, and easier aggregation around key fields. For these reasons, the Data Model is designed so that picklists are recommended to be used throughout the model to the greatest extent possible.

In some cases, however, there may be important reasons for allowing multiple responses to be captured. For example, a single carbon crediting project may include the application of multiple crediting methodologies (e.g., afforestation and reforestation, or clean cookstoves and energy efficiency). This issue was also considered in negotiated COP decisions and is reflected in the latest Article 6 guidance. Indeed, the recommended reporting requirements for Article 6.2 allows Parties to report multiple values for fields like sector.[27]

Proposed Approach: To address these challenges, the Data Model uses picklists wherever possible, and for key project-related variables introduces a Sub-Project Information data table to capture variables that can be recorded more than once within a single project.

For project variables where multiplicity is a necessary option for users, the Data Model includes a Sub-Project Information data table. For example, variables such as 'project type', 'methodology', 'sector', and 'mitigation type' (e.g., reduction, removals) are captured in this Sub-Project Information data table (which appears as an additional sheet in the Excel workbook). Within the Sub-Project Information data table, picklist values are used to support data normalisation. Meanwhile, fields that are by definition uniform over single projects, such as the name of the project developer, are captured in the overarching Project Design data table. This allows for multiple values to be captured against variables in a more

[27] UNFCCC: Reporting obligations.

targeted way, while allowing users necessary flexibility. In cases where no multiplicity is necessary, the Sub-Project Information and Project Design data tables will be at the same unit of analysis.

4.1.2 Defining picklist values

Challenge: As introduced in the prior section, data normalisation principles would support the use of predefined and mutually exclusive, collectively exhaustive (MECE) picklist values for data entries—but, the choice of what fields to assign picklists to and what values to include for them is not straightforward.

For some data fields, a picklist can be included to help standardise data and reduce erroneous data entry. Standardising data fields covering project categorisation, including 'program type', 'mitigation type', 'sector', and 'project type' is important to allow users to better compare projects and credits. To minimise erroneous data entry, standardising picklists for certain fields where entries can be lengthy, such as 'methodologies' or market participant names (e.g., registries), is also desirable.

Due to the diversity of existing approaches, there is a need to decide on the values included in the picklists within the Data Model. The absence of commonly used picklists for key data fields creates challenges ingesting, exchanging, integrating, and analysing data across different market participants, including registries. For example, without a common approach to fields like 'project status', it can be challenging to easily query and compare data on whether projects have been listed, validated, registered, etc.

Proposed Approach: To address these challenges, the Data Model includes illustrative picklists for key variables, using common market practices or internationally recognised approaches wherever possible—noting that these may not yet be comprehensive and may require future updates.

Picklists included in the Data Model are largely adopted or adapted from existing approaches to standardising data fields. For geography-specific data, including 'country' and 'currency', the picklists are populated with ISO codes because of their global recognition as best practice. Sector picklist values reflect the International Standard Industrial Classification of All Economic Activities (ISIC) (see Section 4.2.4), given its widespread coverage of economic activities and strong governance and maintenance processes. For some data fields, the Data Model adopts and augments picklist values directly from CAD Trust, given the robust stakeholder consultations undertaken to develop the CAD Trust data model. These data fields include: 'project types', 'methodologies', 'carbon crediting programs', 'registries', and 'validation and verification bodies' (VVBs), amongst others. These picklist values will need to be further revised to ensure accuracy as well as augmented to be comprehensive of all methodologies, as well as to reflect new participants in the carbon credit market. Picklists related to Article 6.2 AEF fields are adopted directly from the Article 6.2 guidance.

Many picklists will be actively updated and maintained as carbon credit markets mature and scale. As more methodologies, carbon crediting programmes, VVBs, and registries are introduced, the picklists related to these data fields, amongst others, would need to be updated to capture new entrants. For ease of reference, cells in the Data Model itself that contain picklists are coloured green.

The body responsible for piloting and implementing the Data Model, with willing jurisdictions and market participants, would be responsible for maintaining picklist values. This would include updating them in response to policymaker feedback on a regular basis. More details on considerations for piloting and implementation are included in Sections 5 and 6.

4.1.3 Embedding Article 6 reporting fields into the Data Model

Challenge: To be as helpful as possible to end users, the Data Model aims to promote data standardisation across the carbon credit life cycle, while additionally capturing Article 6 reporting requirements where these are known, even if these differ in scope and granularity from the rest of the Data Model.

Per Section 3.2 above, fields to enable Article 6.2 reporting through the AEF are captured in the Data Model. There are several AEF tables that serve different purposes—for example, the Authorizations data table captures critical fields on the scope and restrictions of ITMO authorisation, while the Actions data table captures information about the transferring and receiving parties, as well as information on the underlying mitigation being transferred.[28] Capturing all the information in the AEF in its entirety poses three challenges for the Data Model:

1. **Possible duplication**. Some AEF fields appear in more than one data table. The design challenge for the Data Model is whether to replicate the AEF tables exactly as they are, or to reduce duplication wherever possible, in line with data normalisation principles.
2. **Similar or overlapping variables**. The AEF contains some recommended reporting fields that either overlap perfectly with others in the Data Model (e.g., vintage), or are substantively similar but not at the same level of granularity (e.g., sector).
3. **Linking to the rest of the data table**. The AEF in its raw format is a template and therefore primary and reference keys would need to be introduced to enable illustrative linkages to the rest of the Data Model.

Proposed Approach: To address these challenges, the fields in the AEF are replicated as separate data tables, distinct from the baseline data tables, with illustrative encodings, primary/reference keys, and mapping tables added where appropriate.

1. **The current draft of the Data Model replicates the AEF in its entirety, with separate sheets for each of the recommended AEF tables.** This has the advantage of showing, in a visually accessible manner, that the Data Model faithfully captures the recommended reporting requirements negotiated at COP29 in Baku. It does mean that a deliberate design decision has been taken to sacrifice data normalisation in favour of accessibility of the resource in this instance, and that some fields may be duplicated. Parties using the resource would be free to normalise and delete duplicate fields as desired.
2. **Where similar fields to those captured in the AEF are present in the baseline data tables in the Data Model, the fields are referenced across both data tables and data field encodings include 'aef' to distinguish between them if they are recorded differently.** This applies to 'vintage', 'sector', and 'mitigation type'. 'Vintage' is recorded the same in both the baseline data tables Data Model and in the data tables that reflect the AEF. For 'sector', an illustrative mapping is provided separately in the table annexed to the Data Model to support translation. Where mappings are either not possible or incomplete, the field is duplicated and recordable as free-form text to align with AEF guidance. The suggestion would be for users to fill these fields in twice: once in the standardised format proposed in the Data Model and again in the AEF format (where applicable).
3. **The current draft of the Data Model adds primary and reference keys to the AEF keys to illustrate linkages with the rest of the resource.** This is the only addition or edit made to the AEF fields as set out in the recommended Article 6.2 reporting guidance.

[28] UNFCCC: Reporting obligations.

The Data Model would need to be updated to capture Article 6.4 fields as, and when, the PACM Registry and guidance is finalised. Updating the Data Model to incorporate these fields is something the pilot phase will be expected to address (see Section 5 on implementation and adoption pathways). This would require working closely with the UNFCCC Secretariat to update the Data Model in response to PACM Registry requirements as needed.

4.2 Data field-related design decisions

4.2.1 Project and batch-level identifiers

Challenge: Carbon credit markets currently lack standardised, global unique identifiers for projects and batches (and credits)—an essential element for market integrity, and one that could enable smoother cross-border trading and integration with market infrastructure.

Today, different market participants assign different types of unique identifiers to each project and to each individual credit issued, typically known as project identifiers and carbon credit serial numbers, respectively. Identifiers are normally first assigned by registries, but currently different market participants employ divergent approaches to the issuance of unique identifiers, both in terms of how they are formatted and the information that they capture. For example, some capture the VVB that assessed the project while others do not.

A lack of a common approach hinders the ability to track credits across the life cycle and across borders, ultimately increasing the risks of double counting and reducing trust in the market. Limited country oversight into how identifiers are set also makes it challenging for countries to account for credits issued in their jurisdictions. The absence of standalone batch level identifiers also hinders the ability for buyers to easily identify credits with similar characteristics. The absence of a common approach—both to the format of unique identifiers and to the institutions at a country-level responsible for implementing them—also increases the risk of registries issuing either duplicate identifiers or conversely adopting totally divergent approaches.

Existing formats for identifiers also have high administrative burdens and do not align with data best practices.

There is an opportunity to harmonise approaches to unique identifiers, thereby bringing them in line with best practices followed in other more mature markets, while using a format that integrates more seamlessly into cross-border data infrastructure systems.

Note: The Data Model does not take a position on whether credits should be financial instruments (and regulated as such) or not.

Proposed Approach: To address these challenges, the Data Model proposes a common approach to project and batch level identifiers—based on best practice insights from other more mature markets—that users can extend to the credit level if they wish.

The benefits of a common approach to unique identifiers:

The proposed unique identifiers are designed to support proper tracking of credits and to mitigate risks of double counting. A unique identifier makes projects and batches more easily traceable, reducing the risk of double counting in issuance, claims, and retirements. A common approach to unique identifiers would also allow countries to track mitigation outcomes in their jurisdiction more smoothly, for market oversight and/or NDC tracking purposes, and to ensure that host countries receive an appropriate share of financial proceeds tied to the mitigation outcomes.

Assigning identifiers at both project and batch level enables buyers to source credits more easily and at scale. An identifier at the batch level—which can be fractionalised further by market participants as needed—can also support buyers by identifying credits with similar characteristics and reduce the risk of credits in the same batch being treated differently (from an integrity perspective) by the wider market.

The proposed unique identifiers are designed to be a technology-agnostic approach in a machine-readable format. The intention is that the identifiers meet the minimum level of transparency needed to minimise computing time, data transmissions, and storage. In order to meet these criteria, the proposed unique identifier format applies insights from the design of International Securities Identification Numbers (ISINs), which are used to identify securities in cross-border transactions.[29]

Proposed format for project and batch identifiers:

The proposed format for unique identifiers is based on a review of existing practices in carbon credit markets and a consideration of best practice in cross-border financial markets. The proposed format is constructed as follows:

- *Project identifier.* A format resembling the structure of ISINs is proposed for the project identifiers. They would include the following:
  - A code to indicate the class of instrument (e.g., 'CB' for carbon credits)
  - A country code based on ISO 3166 (e.g., 'GY' for Guyana)
  - A unique, four-digit, alphanumeric project code (e.g., '1234')

So, for example, the project identifier **'**CBGY1234*'* would relate to carbon credits from Guyana related specifically to project 1234.

Importantly, the proposed unique identifier can be extended to sub-project identifiers, if required. Explanatory notes for the methodology to extend identifiers can be found in the Data Model itself and in Annex C.

- *Batch identifiers:* The project identifier would then be extended to batches as follows:
  - The assignment of a three-digit alphanumeric code for batches (e.g., '001')
  - A single check digit (e.g., '6') that is used by computer systems to make sure the identifier is not entered in error. These digits are generated using a formula that considers the other digits in the unique identifier. The Luhn algorithm is commonly used for this purpose.[30]

So, for example, the unique identifier described above, if extended to include a batch identifier could be: **'CBGY12340016'**.

[29] An ISIN, or International Securities Identification Number, is a 12-character alphanumeric code used to uniquely identify financial instruments globally. It is analogous to a universal barcode for securities, ensuring that trades, clearing, and settlement processes are accurate and consistent, especially across international markets.
[30] Stripe: Luhn Algorithm (2025)

Importantly, the proposed unique identifier also can be extended to the credit or unit level, if required. Explanatory notes for how to do this can be found in the Data Model itself and in Annex C.

How the proposed unique identifiers would be generated and assigned:

The instrument, country code, and check digit would not need to be centrally managed. Unique identifiers could be assigned by any registry—whether national or in the voluntary market—provided the format described above is used consistently.

However, a Suitably Qualified Body (SQB)—determined at the discretion of policymakers in each jurisdiction—would need to: issue the attributes described below; communicate them to registries; and store them centrally:

- The four-digit, alphanumeric project code (in the example above: '1234')
- The three-digit, alphanumeric batch code (in the example above: '001')
- A single check digit (in the example above: '6')
- Sub-project and credit/unit identifiers if required (none are shown in the example above)

Upon receipt of these attributes from the SQB, registries would then combine the relevant information to generate a full unique identifier.

Annex C sets out in more detail what the responsibilities of the SQB would be in this proposed model, as well as what potential institutions could play this role. Many institutions will already have institutions that perform similar functions (such as Designated National Authorities for Article 6.4 or the CDM), which may minimise the resource burden of implementing this proposal.

Implementation considerations for the proposed unique identifiers:

Implementing the proposed framework would require piloting and testing with willing jurisdictions and registries, and a transition period to implement it more widely. The full benefits of the proposed system would require a critical mass of countries appointing SQBs, and the willing participation of registries and other market participants in piloting efforts. Considerations for piloting and overall governance of the Data Model, including unique identifiers, are set out in Sections 5 and 6.

It is also possible to implement this system of unique identifiers, in a way that accommodates existing unique identifiers generated centrally by UNFCCC, for ITMOs under Article 6.2. A worked example of how this would be done is provided in Annex C. Although Article 6.4 credits are currently not in the scope of the draft Data Model, it is possible to accommodate the Article 6.4 unique identifier formats within the proposed system. Guidance for how to do this would need to be provided when the PACM registry requirements are embedded into the Data Model.

4.2.2 Program type

Challenge: There is a large and growing universe of carbon crediting programmes of different scale—from site-specific projects to larger units of analysis, like jurisdictions or entire sectors—that the Data Model should capture and distinguish.

The activities that generate carbon credits can range from individual projects to programmes that cover entire jurisdictions. The majority of the carbon credit supply today comes from individual projects developed by project developers, e.g., a reduced deforestation project. These projects, known as standalone projects, are typically registered in independent registries and can be pinned down to a specific site. These projects define emissions baselines within their specific sites, based on historical and modelled emissions.

However, increasingly, some large-scale programmes are developing jurisdictional-level frameworks. These programs, known as scaled-up programs, are where credits can be generated by much larger entities, such as entire jurisdictions/regions or sectors. For example, the LEAF+ coalition allows countries or sub-national jurisdictions to commit to a credible policy platform on arresting and reversing deforestation, and to issue carbon credits for actions going above and beyond that platform.[31] More nascent approaches are considering credits to be issued by particular sectors in a given jurisdiction, for sectoral decarbonisation beyond an agreed and credible transition plan.[32] These programmes are not tied to a specific project site, as they can extend to whole regions and sectors. As such, emissions baselines are baselines across a region or sector.

Some programmes also take a nested approach, combining the scale of a standalone project within a broader jurisdictional framework. These projects, known as nested projects, are developed on a specific site, much like standalone projects. However, the key distinction is that nested projects align their emissions baselines and accounting with regional or national baselines. This means that these projects would issue batches of credits much like standalone projects, but the number of credits issued is adjusted to avoid double-counting with the jurisdictional-level programme based on the jurisdictional baseline.

The Data Model should capture each of these programme types—being flexible to different possible approaches while allowing users to distinguish between them.

Proposed Approach: To address these challenges, the Data Model includes a 'program type' data field that suggests a standardised picklist to group programmes into different program types.

A program type data field allows projects to indicate the type of programme through a standardised picklist value. The options for this are: standalone project, nested project, or scaled up program—at a national (or sub-national) level.

4.2.3 Accounting for multiple jurisdictions through the 'related projects' field

Challenge: Carbon crediting projects can theoretically span multiple geographies—however, emission reductions typically need attribution to single countries.

It is possible for carbon crediting projects to span multiple jurisdictions, particularly in the context of scaled-up crediting approaches. For example, a jurisdictional REDD+[33] project may start within a single state or province in a country but subsequently be expanded to include multiple sub-national units. It is even possible for projects to span multiple national boundaries—while few examples exist presently, cross-border cooperation for carbon crediting projects are theoretically permissible under Article 6.

However, it is typically necessary at the point of registration—and more generally, for emissions accounting purposes—to assign mitigation outcomes to single countries. This is the case under the Article 6 reporting rules and is considered critical for avoiding double counting of emissions reductions more generally. The challenge for the Data Model, therefore, is to accommodate projects that span multiple jurisdictions, while at the same time assigning emissions reductions discretely to individual countries for emissions accounting purposes.

[31] Emergent = messaging on LEAF value proposition to forest governments, LEAF Coalition Value Proposition to Forest Governments (2023).
[32] EDF: Sectoral Crediting: getting governance right from the beginning (2010).
[33] REDD+ refers to activities that reduce greenhouse gas emissions from deforestation and forest degradation, alongside wider activities including sustainable management of forests, and the conservation and enhancement of forest carbon stocks.

Proposed Approach: To address these challenges, the Data Model includes a 'related projects' data field to capture projects that span more than one jurisdiction.

Projects spanning multiple jurisdictions would be recorded as separate Data Model entries for each jurisdiction. Guidance on how to do this is also reflected in the 'notes' column of the Excel workbook. This approach is necessary for emissions accounting purposes, as typically mitigation outcomes need to be assigned to individual jurisdictions and attributed between them where necessary. To indicate that these projects are related to each other, the 'related projects' data field should be populated with the unique identifiers of projects related to the project in question.

Following this approach, a project reducing emissions across two countries (A and B) will be split into two records, one for each country. Each record will have a unique project identifier, but share the same project details (name, description, etc.). This approach has been proposed to maximise compatibility with national emissions accounting, to enable accurate application of Corresponding Adjustments, and to assist investors and buyers in selecting projects that align with their country-specific criteria.

Note that the method for dividing emissions reductions between countries in this example would need to be agreed bilaterally, subject to any forthcoming guidance released by UNFCCC. The Data Model would not impose any assumption on how total emissions reductions are divided but would note in explanatory text that the emissions reductions or removals associated with individual countries should sum to the total estimated mitigation across the entire project, and no more.

4.2.4 Sector classification

Challenge: Approaches to classifying the underlying economic activity of carbon crediting projects vary significantly and can be hard to map to widely recognised industry classifications. This limits the ability of policymakers, investors, and buyers to systematically benchmark and compare credits or align with broader economic or emissions reporting systems.

A robust sectoral classification system supports analysis of mitigation potential by sector, identification of policy interactions, and cross-comparison of projects. It also improves the ability of buyers and investors to filter and evaluate credits based on sectoral exposure.

Today, however, many carbon credit market data models use bespoke sectoral classifications. The absence of a common approach can make it challenging to apply classifications across jurisdictions or to map to commonly used industry classifications for accounting and reporting. Many classifications classify carbon crediting activities at a high-level, mainly covering where there is project development today rather than all economic activities. As the market continues to develop and scale, this may have to change.

Proposed Approach: To address these challenges, the Data Model proposes the use of the International Standard Industrial Classification of All Economic Activities (ISIC) by market participants when recording sectors.

ISICs was developed by the UN Statistics Division to provide a standardised international framework for classifying all economic activities across countries and industries. The classification is maintained by the United Nations and is used by various stakeholders; it forms the basis of several national industrial classification systems as well as existing carbon credit market data models. Given the strong governance

and maintenance process for ISICs; its broad coverage of economic activities; widespread use; and ability to map to other classifications, it has been suggested for use in the Data Model.

Specifically, the Data Model suggests the **division level (01–99)** of ISIC for use for the sectoral picklist. The division level was selected to offer sufficient granularity to distinguish between relevant economic activities—such as energy generation, manufacturing, and construction—and can be mapped to more granular levels as needed.

It should be noted that market participants reporting into the UNFCCC International Registry[34] would still need to report sectors as per guidance in the AEF, in addition to ISICs in the Data Model.

4.2.5 Project types and methodologies

Challenge: There are hundreds of carbon crediting methodologies in the market today, with new methodologies being developed, making it challenging to group them and standardise a picklist for the 'methodology' field.

There are currently hundreds of carbon crediting methodologies, and different data models record them in different ways. It is not within the scope of the Data Model to assess which methodologies meet regulatory or voluntary standards for environmental integrity. So, ideally, the Data Model would capture them all. Methodology titles can have many digits as well as underlying data elements, creating significant scope for error and data aggregation issues, particularly if this information is recorded in free-form text.

There are also divergent approaches to grouping methodologies that refer to 'similar' projects. Several existing schemas, such as the CAD Trust data model, include a higher-level variable for project or activity types, in which multiple methodologies can be grouped. For example, carbon crediting projects related to energy efficiency could include methodologies for industrial and residential heating transformation. While some data models impose a 'one-to-many' mapping between project or activity types and methodologies, others allow for a many-to-many mapping. The absence of a uniform approach to aggregating methodologies makes it challenging to identify projects with similar characteristics efficiently, creating an unnecessary administrative burden for policymakers, buyers, and investors.

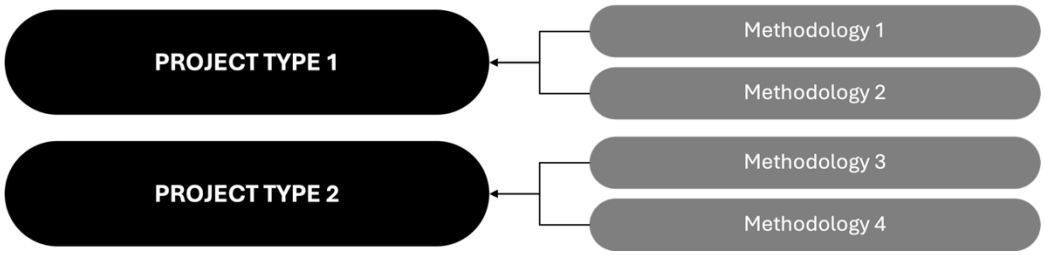
Proposed Approach: To address these challenges, picklist values seeking to capture the universe of methodologies have been included in the Data Model as well as a 'project type' data field to group methodologies, with a one-to-many relationship imposed between the project type and methodology data fields.

To avoid the significant risks of allowing free-form text for hundreds of possible methodologies, the Data Model would seek to provide a discrete picklist value of all publicly available methodologies. The initial list in the draft Data Model is sourced and augmented from CAD Trust and, over time, could be sourced from voluntary, UNFCCC and national/regional registries. This information would need to be updated and maintained on a regular basis, with policymakers submitting regular information on national approaches to a competent body that maintains the Data Model. Proposed features of such a governance and information-sharing model are set out in Section 6.

In addition, the Data Model includes a project type field where methodologies are grouped and map to one project type. Project type picklists from CAD Trust's Data Model are utilised as they enable this mapping illustrated in Figure 8 below.

[34] UNFCCC: International Registry (2025)

Figure 8: Project types and methodologies map one-to-many (illustrative)



For example, a methodology for 'energy efficient lighting' would fall under a project type for 'energy demand', and no others. This would allow for easy querying of methodologies that have similar characteristics.

4.2.6 Geographic location data

Challenge: There is no standardised form to capture geographical location data for carbon crediting projects. In addition, it is increasingly recognised that precise boundaries of carbon crediting projects may be necessary for accurate emissions accounting.

Capturing geographic location data of carbon crediting projects is important for traceability and integrity. Geographic location data can be important to carbon credit market participants across the value chain. However, geographical location information is currently recorded differently across programmes and registries, with a wide array of formats used and different levels of specificity provided. For example, data formats and reference systems vary widely, with some carbon crediting programmes using Shapefiles, while others use KML or more simple latitude/longitude coordinates. This inconsistency complicates data integration and analysis. For certain project types, like renewable energy, energy efficiency in the industry, or direct air capture, a single central point may suffice for most use cases. However, for others, such as REDD+, afforestation, mangrove restoration, or cookstoves, detailed project boundary data is necessary. To be accurate and usable by market participants, this data should go beyond a central point in the project area or the coordinates of a representative office, warehouse, or distribution facility.

Recording project boundaries and updating this data to ensure it is reflective of the project over time is also critical to ensuring project integrity through accurate emissions accounting. Capturing up-to-date and standardised project boundary data allows stakeholders: to assess if project areas have shifted or if they overlap; to analyse potential leakage areas; and identify if projects span sub-jurisdictional and jurisdictional boundaries. These considerations help to ensure that the project is not overstating its mitigation potential or double counting mitigation outcomes.

Proposed Approach: To address these challenges, the Data Model suggests a multi-tiered approach to recording geographic location data, including geographic boundaries.

The absence of a common approach to project location data is well-recognised by carbon credit market experts and cannot fully be solved by the Data Model. This is a valuable avenue for future research and could be considered alongside further updates to the Data Model in the medium term (see Section 5).

As an intermediate step, the Data Model captures several data fields related to geographic location. These include 'country', 'subnational jurisdiction', 'project latitude', 'project longitude', and 'project geographic boundaries'. How to record geographical location data more precisely is an ongoing area of

research and contestation amongst carbon credit experts, especially for projects that cover a large land area. To avoid front-running the resolution of these debates, the Data Model does not impose a uniform approach to capturing GPS coordinates within a project boundary. This means that for smaller projects (e.g., an energy efficiency project within a commercial building), the coordinate points can refer specifically to the site. For larger projects, e.g., an afforestation project, the coordinate points could be recorded within multiple locations within the site.

However, to address potential inconsistencies that arise by recording latitude and longitude, the Data Model also contains a field to capture the project's spatial boundaries. It is suggested that market participants record a link to a file that contains the specific geographic boundaries of the project. The Data Model does not prescribe how to record geospatial coordinates by project type or which commercial format to use.

Further work to standardise project boundaries can be reflected in future iterations of the Data Model. For example, if project boundaries for different project types are defined, this guidance could be reflected in the Data Model, as well as the treatment of leakage areas by project type and whether these should or should not be included within the project boundary.

4.2.7 Monitoring, reporting and verification-related data

Challenge: While multiple data points may be captured during the process of monitoring, reporting, and verification (MRV) of emissions reductions/removals, including digital MRV (dMRV), it is challenging to standardise these across project types.

When conducting verification events, VVBs verify a large body of data collected by the project developer. Verification events require VVBs to verify various aspects of implementation of the Project Design Document, including achieved emissions mitigation. The full set of data points captured, however, extends far beyond this. Data points captured by the project developer and verified by VVBs can be highly specific to project types and methodologies. For example, project developers may need to capture granular measures of tree cover in a jurisdictional REDD+ project, or detailed metrics of energy usage of different types in an energy efficiency project.

Including a detailed list of MRV fields across project types could number into the hundreds of fields, which would be inconsistent with the Data Model's stated purpose as a common foundation on which market participants could build and innovate.

Moreover, the emergence of dMRV further complicates the standardisation of MRV-related data. dMRV is introducing data from a large variety of new sources, including Internet-of-Things (IOT) devices and satellite imagery, which could lead to a proliferation of data across various formats and methodologies. This field is nascent and data sources and formats will continue to change and develop, complicating efforts to standardise MRV data in the near term. In addition, the introduction of dMRV could require changes to existing workflows for project developers as well as VVBs, amongst others.

Proposed Approach: To address these challenges, the Data Model is limited to MRV fields that are standardisable across project types, noting the potential for future enrichment of the resource in the future.

The 'Project MRV' data table captures a small number of data fields related to MRV. The Project MRV data table covers individual verification events, specifying: the project undergoing verification; the VVB responsible for verification; a link to the verification report; the start and end date for which the verification

applies; the verified emissions mitigation; and any adjustments for leakage and contributions to buffer pools.

Verification reports contain a larger set of data points where further standardisation could be desirable in the future. Due to the high level of heterogeneity across verification events, further data fields related to MRV are not included, however, the Data Model suggests a link to the verification report be captured to allow users to easily identify and access the additional MRV-related data in the wider report.

4.2.8 Eligibility labels

Challenge: Market participants have communicated that carbon credits deemed eligible for use in carbon pricing schemes, or other internationally recognised indicators of credit integrity, would command a price premium. However, eligibility labels are not currently tracked and recorded in a standardised and transparent manner.

Some carbon pricing schemes permit the use of carbon credits to meet a portion of compliance obligations—in such cases, a designated national or regional authority determines which types of carbon credits are eligible for use within the scheme. These eligibility determinations can vary by scheme, apply at different levels (e.g., to specific carbon crediting programmes, projects, methodologies, or even vintages), and may also be time-bound. As a result, there is no single or consistent method across jurisdictions for defining or recording eligibility. Nonetheless, labels that help buyers determine whether a credit is approved for use in a particular emissions trading scheme are highly valued and may influence pricing.

It is also true that buyers and some policymakers value information on internationally recognised, standardised indicators for credit integrity, including CORSIA eligibility and the Integrity Council for the Voluntary Carbon Market (ICVCM) Core Carbon Principles (CCPs).

However, the decision of which labels—if any—to include in the Data Model, and if applicable, how to structure them and at what level to apply them (e.g., project, sub-project, batch or credit) is not straightforward for several reasons including:

- **Policy sensitivity.** There are divergent views on the value of including credits in carbon pricing schemes, as well as what safeguards or eligibility criteria should be applied. Some countries express concern that explicitly referencing eligibility could be seen as a tacit endorsement, thereby infringing on national sovereignty or influencing policymaker discretion.
- **Governance considerations.** Even if these fields are included in a strictly factual manner, with relevant disclaimers to avoid the perception of tacit endorsement, a robust governance framework for the Data Model would need to be in place to ensure that eligibility labelling decisions lie squarely with competent authorities, to avoid the risk of market actors self-assigning inappropriately.
- **Data structure complexity.** Given eligibility criteria can be applied to different levels, it is important to ensure eligibility is reflected accurately while minimising duplication. In addition, multiple eligibility labels may apply to a single credit, and there is an additional possibility that eligibility is timebound. This suggests that the use of a single picklist capturing all schemes would not be the most optimal solution, and requires a more flexible, relational structure to manage eligibility data effectively.

Proposed Approach: To address these challenges, the Data Model proposes eligibility labelling be recorded at the highest level of aggregation and that the labels be captured by predefined picklist values, reflecting policymaker decisions on eligibility.

Market participants need to label credits to transparently identify and track eligibility in machine-readable formats across both national and independent market systems. The Data Model, therefore, includes predefined picklist values to indicate whether credits from a particular project or batch are eligible for use in selected carbon pricing schemes, as well as contextual information (e.g., if they are under consideration). Each scheme has its own field (e.g., corsiaEligibility, chileCarbonTaxEligibility), allowing multiple eligibility labels to be applied while maintaining data normalisation. Only schemes that allow credits to meet compliance obligations are included, and these fields would need to be updated and maintained over time to ensure all relevant schemes are included. To avoid confusion and address policy concerns, explanatory notes and visual aids will include the following disclaimer:

> *"These fields are designed to capture eligibility in a strictly factual manner, if and where it exists. Where market participants do record eligibility in their own data, the Data Model seeks to facilitate their doing so in a consistent and transparent manner.*
>
> *The Data Model is not a tool to influence substantive policy decisions for what credits—if any—are eligible for regional, national or sub-national carbon pricing schemes. Such schemes may have eligibility restrictions, including (but not limited to) region of origin requirements, that are decided solely at the discretion of relevant regulators and not captured here. Labels only capture eligibility that has been decided by regulators, and project developers will not be able to state eligibility of their own projects or credits.*
>
> *The inclusion of specific labels at either the sub-project, project, or batch level does not constitute an endorsement of underlying eligibility requirements, nor is it intended to foreground specific labels over others."*

Because eligibility can be applied at different levels in different schemes, the Data Model includes separate data tables for project level, sub-project level, and batch level eligibility that could then be extended to the credit level. This ensures flexibility to reflect real-world differences, such as CORSIA's eligibility criteria in the first phase compliance period being both methodology and vintage dependent. ICVCM CCP eligibility is assessed against two attributes: crediting methodologies and programme governance (programme refers to carbon standards, like Verra and Gold Standard). This means that the methodology specific field is recorded at the sub-project level (see Section 4.1.2), while programme eligibility is captured in the Project Design data table.

For the avoidance of doubt, the Data Model does not include information on the actual credits that are eligible for schemes, but merely records, in a standardised manner, the names of these schemes, and standardised metrics in a picklist relating to eligibility status (e.g., 'under consideration', 'approved', 'rejected') that market participants could apply.

Schemes that do not allow carbon credits to meet a portion of compliance liabilities would not be recorded in the Data Model.

4.2.9 Purpose of retirement data

Challenge: Reporting the purpose of retirements can be helpful for data aggregation and analytics; this information is not currently standardised or reported consistently.

There are diverse and evolving use cases for carbon credits, making it difficult to standardise the reasons for retirement. End users may retire credits for a variety of purposes, such as contributing to a country's Nationally Determined Contributions (NDCs) under the Paris Agreement, meeting part of domestic carbon pricing obligations, complying with sector-specific schemes (e.g., CORSIA), or for use in a voluntary private sector climate strategy (underpinned by a robust mitigation hierarchy). These reasons often vary by geography, sector, and organisational goals, and new use cases continue to emerge as the market matures.

Different jurisdictions may also regulate what carbon credits can and cannot be used for; this may circumscribe the purposes of retirement. In these cases, it is important that the Data Model not presuppose specific purposes if these are deemed inappropriate by policymakers in different jurisdictions.

Proposed Approach: To address these challenges, the Data Model includes a free-form text field for the purpose of retirement.

This approach allows market participants to articulate, in their own words, their specific reasons for retiring carbon credits, ensuring flexibility and inclusivity for a wide range of use cases. While this may introduce variability in the data, it preserves the richness of information and avoids the limitations of a predefined picklist. Over time, patterns and common themes could be identified through text analysis, enabling the potential development of more standardised categories as the market and its use cases become more defined.

Future iterations of the Data Model could consider including a picklist for this field, provided care is taken not to pre-empt regulatory treatment of carbon credit retirements. The current draft could be adapted in response to consultation feedback, if there is a strong push to include picklist values instead of freeform text. This is also a potential topic for future research and engagement in pilot phases of the Data Model's implementation.

4.2.10 Inclusion of co-benefits

Challenge: Some types of carbon credits foster significant additional co-benefits, many of which are highly local, specific, and challenging to standardise.

It is well known that carbon crediting projects can bring additional co-benefits to communities and the wider environment. For example, REDD+ projects may additionally increase biodiversity and create jobs in new industries. Major carbon crediting programmes now employ systematic approaches to capturing these, often using metrics aligned to the UN 2030 Sustainable Development Goals (SDGs).[35] Some (but not all) feedback received from PWG and SFWG members included recommending that fields related to co-benefits be included in the Data Model. Several SFWG members also raised the importance of co-benefits at the 12 June 2025 SFWG meeting in Cape Town, South Africa.

However, beyond capturing in a binary fashion whether a co-benefit does or does not exist, in practice it is challenging to quantify and record these impacts. This is partly because to make meaningful statements on non-environmental impacts, multiple metrics need to be tracked and recorded—indeed, the UN Global Indicator Framework for the 2030 SDGs capture more than 100 metrics.[36] Additionally, impacts on biodiversity and local communities, including indigenous peoples, tend to be very specific to local circumstances. Standardisation in this context would pose a significant risk of obscuring important nuances. From a data structure perspective, including significantly more fields to capture metrics associated with co-benefits may additionally undermine the Data Model's effort to be a common foundation on which market participants can build and innovate.

For these reasons, it is recommended that the Data Model not include fields related to co-benefits at this stage, but this could be revisited in the future as a potential area of further exploration.

[35] Gold Standard, SDG Impact Tool (2022).
[36] UN Stats, Global Indicator Framework (2025).

Section 5: Implementation and adoption pathways

Further engagement with market participants—including through piloting—is needed to support refinement, usability, and adoption of the Data Model across the carbon credit ecosystem. This section outlines the key adoption levers that can drive broad-based adoption across jurisdictions and stakeholder groups (Section 5.1) and a phased implementation plan (Section 5.2).

5.1 Adoption Levers

G20 SFWG support for data standardisation, which has catalysed and guided the development of this Data Model, is important, but achieving widespread voluntary adoption implies fostering adoption through market, policy, and standard-setting levers. Wide voluntary adoption of the Data Model can be achieved through targeted levers, including embedding the Data Model into carbon credit market participants' existing data systems and workflows (particularly with national, sub-national and independent registries); encouraging uptake through policy recommendations and regulatory guidance; and alignment with international standard-setting efforts.

5.1.1 Embedding into existing market participant systems and workflows

Voluntary uptake by national, sub-national, and independent registries will be critical to validating the Data Model's utility and driving adoption. Within the carbon credit market ecosystem, registries are responsible for recording and storing a majority of the data, including on project design, credit issuance, and retirement. Project developers will also typically record project data in accordance with documentation templates issued by registries. To ensure the Data Model is practical and effective, it must be tested and refined in collaboration with both national registries—which oversee international emissions accounting—and independent registries.

Broader voluntary adoption of the Data Model so that it can act as a common foundation for data standardisation would require engagement with, and action from, additional participants across the carbon credit markets value chain including:

- **Buyers and buyer coalitions advocating for the benefits of data standardisation, and through time prioritising purchasing credits that are supported by the sort of data identified in the Data Model,** including unique identifiers, on the grounds that such standardisation reduces due diligence costs.
- **Market intermediaries including verifiers, marketplaces, and exchanges ensuring that standardised data structures are introduced and maintained** across credit verification and trading workflows.
- **Data and market infrastructure efforts in the carbon credit markets reflecting and, where applicable, adopting the suggested approaches to the foundational data fields in the Data Model.** The Data Model can provide a common foundational schema for technical architectures, and could be referenced as a common foundation to support more specific and technical applications, including for initiatives like the CAD Trust and CDOP.

5.1.2 Policy and regulatory levers

National and sub-national governments, as well as regulatory authorities, are well-positioned to benefit from and drive adoption by making use of the Data Model in public infrastructure and frameworks. They could consider:

- **Using the Data Model as a reference for national or sub-national registry development or enhancement.** The Data Model can serve as a common and accessible foundation when designing

national or sub-national registries to standardise data on project design, registration, credit issuance, tracking, and retirement data across systems. Implementing the proposed system of unique identifiers would also enable better cross-border tracking of projects and credits, with many benefits including reducing the risk of double counting and supporting robust emissions accounting.

- **Encouraging and supporting the use of the Data Model by private sector participants, across the carbon credit life cycle, operating within their jurisdiction.** This would help improve data quality and enable greater consistency across platforms. If multiple countries adopted this approach, it would significantly ease existing frictions in cross-border carbon credit markets.
- **For credits authorised under Article 6, encouraging market participants to record and submit the relevant data to policymakers in a standardised format that the Data Model outlines.** Specifically, policymakers could encourage: (i) domestic registries or other entities tracking and recording the use of ITMOs as outlined in the Data Model and, in particular, using unique identifiers in line with the proposed format in section 4.2.1.[37]; (ii) Parties to Article 6 Agreements reporting to UNFCCC using the Data Model to share AEF data in a consistent and standardised format with UNFCCC; and (iii) 'Authorised entities'—non-state actors involved in the creation of mitigation outcomes authorised for use under Article 6.2—recording any necessary data in line with the Data Model and sharing this data with relevant regulatory authorities as appropriate.[38]
- **Embedding suggested approaches to standardising data fields as described in the Data Model into relevant disclosure requirements.** While the Data Model itself does not make any recommendations on which data fields should be reported externally, policymakers could use it to inform their disclosure frameworks to improve transparency and comparability.

5.1.3 Levers related to international standard-setting efforts

Given its potentially important role in supporting data standardisation, the Data Model could be formally considered in emerging and ongoing international standard-setting processes that seek to address aspects of carbon credit market data and disclosure, including:

- **CORSIA eligibility criteria.** The International Civil Aviation Organization's (ICAO) CORSIA scheme relies on a set of eligibility criteria to ensure that only high-integrity carbon credits are eligible to be used by airline operators in offsetting international aviation emissions. The Technical Advisory Body (TAB)—an expert panel that advises the ICAO Council—regularly reviews and updates these criteria. As data integrity and comparability become increasingly important for carbon credit markets, ICAO could consider referencing the use of the Data Model in its eligibility criteria.
- **ICVCM Continuous Improvement Work Programmes (CIWP).** The CWIP is a multi-year process to refine the ICVCM Core Carbon Principles (CCPs) and align carbon crediting programs with global best practices. The ICVCM could consider supporting data standardisation within its next phase of CIWPs, including potentially promoting alignment with the Data Model.
- **Disclosure frameworks and standards.** Several frameworks and standards address disclosures that corporate users of carbon credits should make, including, for example, those of the International Sustainability Standards Board. Standards may ask that companies disclose their use of carbon credits, including, among other things, the type of credits used; the project characteristics; and whether the credits align with specific integrity frameworks or mitigation claims. At a minimum, the Data Model could help improve data that companies draw on to prepare their disclosures, and once the Data Model has been sufficiently tested and adopted, may support any subsequent guidance to disclosing parties that those responsible for these standards deem necessary.
- **The International Standards Organisation (ISO)'s proposed standard for a data model for carbon credit markets.**[39] ISO has previously developed and encouraged uptake of standardised approaches emerging from G20 work, for example with the ISO 20022 standard on payments messaging. If ISO does

[37] See also Annex C on mapping unique identifiers to Article 6 identifiers.
[38] UNFCCC: Article 6.2 reference manual (2024), p. 30.
[39] BSI, Data Model for Carbon Credits (2024).

take forward the development of a data standard it could ideally build on the Data Model, and/or specific elements such as unique identifiers, that emerges from this consultative process, and which references the CAD Trust and CDOP approaches.

The next section of this note considers a phased approach to implementation.

5.2 Phased implementation Plan

Phase 1 (2025–2026): Country-Level Piloting and Refinement

The first step towards implementation might be to pilot the Data Model in one or more countries, working with both public institutions and private sector actors. Targeted pilots would test the Data Model on discrete areas of the carbon credit life cycle to identify any pain points in the suggested data field standardisation informed by the interaction with existing processes and processes. These pilots will help surface technical and operational insights that can be used to refine the Data Model for broader use.

Specifically, there are three priority areas to be tested in the pilot phase:

- **The development and use of unique identifiers:** The use of unique identifiers that are standardised across market participants is a key contribution of the Data Model and is fundamental to its successful implementation (as described in Section 4.2.1). Implementing the proposed approach will require collaboration between registries and policymakers in one or more jurisdictions. Annex C sets out how the proposed system could be implemented in practice, and how it could be reconciled with existing unique identifier formats for Article 6.2 ITMOs. A comparable process could be followed for Article 6.4 when the PACM Registry requirements are finalised.
- **Integration with national, sub-national, private, and independent registry architecture:** Registries play a significant role in data management in carbon credit markets, recording and storing key data fields over the life cycle of a credit—including data fields related to project design, registration, issuance, and credit retirement. Ensuring registries can effectively embed unique identifiers as well as other standardisation guidelines into their existing data systems will be critical for the wider adoption of the Data Model. Policymakers in piloting countries could test integration of the standardised approaches to recording data as outlined in the Data Model into their own national or sub-national registry architecture, as well as encourage private sector testing and adoption. Private and independent registries could volunteer to support testing on all or part of the projects registered with them. In the piloting process, it would also be necessary to address, in consultation with regulators and market participants, any concerns on data security, market supervision, or otherwise, and adapt the implementation approach accordingly.
- **Incorporation of Article 6 guidance:** Article 6 technical specifications are still evolving and forthcoming and there will be important lessons from countries and market participants to draw on. As noted in Section 4.1.3, the Data Model will need to be updated to reflect the PACM Registry requirements when these are finalised by the UNFCCC Secretariat, as well as any updates on current AEF guidance for Article 6.2. Additionally, there may be benefits to road testing the current approach to embedding the AEF in the Data Model, and working with the UNFCCC, countries, and other market participants to understand whether the proposed structure for capturing the AEF is effective, or if further integration or simplification would be helpful.

In addition to the three priority areas, the Data Model would ideally be tested as widely as possible by different market participants across different stages of the life cycle. A 12–18-month piloting phase would allow sufficient time to begin to gather learnings and capture feedback across the full reporting cycle and to integrate feedback accordingly. This would also involve updating picklist values and other relevant fields on a regular basis, in response to policymaker and market participant feedback.

During this piloting phase, an interim governing body could support technical implementation and manage Data Model updates in response to feedback. An interim governing entity might need to engage with policymakers, registries, and other private sector stakeholders to support technical mapping and alignment. Managing stakeholder feedback and implementing updates to the model, in particular ensuring continued dialogue with the UNFCCC to maintain compatibility with evolving Article 6 guidance, will be a key function of a potential governance entity during this period. The role of such an entity is further discussed in Section 6.

Phase 2 (2027 onwards): Multi-Country Adoption

After the piloting phase, the utility of the Data Model could be assessed by the G20 SFWG based on feedback from piloting countries and market participants. If the piloting phase is deemed successful—demonstrated, for instance, by strong voluntary alignment with the Data Model or by its incorporation into the guidance of standard setters such as ISO, ICVCM, or the ICAO Council—the Model could, from perhaps 2027 onwards, begin transitioning from pilot use to broader, multi-country adoption. A 2027 snapshot of the Data Model, iterated based on input received during the piloting phase, could be shared with the G20 SFWG for review ahead of the next phase, which could focus on scaling uptake and building momentum for integration across market participants and jurisdictions.

To aide this potential transition, the G20 SFWG could consider commissioning the development of practical implementation guidance. This could include technical recommendations and model use cases tailored to different regulatory and infrastructure contexts. It could also deliver voluntary recommendations for how countries might integrate the Data Model into:

- Registry design and updates, particularly for jurisdictions operationalising Article 6.2 and 6.4 arrangements.
- Disclosure requirements, including requirements for carbon credit usage by corporates, and/or external reporting by market participants on credit characteristics like quality, price, use, etc.
- Market infrastructure, such as ratings services, and exchanges.

Section 6: Delivery Model for the Pilot Phase

6.1 The need for an appropriate delivery model

For multiple reasons, there will be a need for an appropriate delivery model for the pilot phase. For the Data Model to be deployed in a series of targeted pilots, refined in response to feedback and testing, and to support its voluntary implementation, it will need to be overseen and maintained by a qualified body. Establishing a delivery model is important for the following reasons:

- **A well-resourced and technically competent body is needed to oversee the three aspects of the pilot phase set out in Section 5.2.** Specifically, the development and use of unique identifiers; integration with national, sub-national, private and independent registry architecture; and incorporation of Article 6 guidance. Fostering uptake of the Data Model will take time, resources, close engagement with market participants, and collaboration with major providers of capacity building. In addition to this process of consultation and engagement, there will be a need to incorporate feedback and to update the Data Model regularly to ensure that the suggested approaches are fit for purpose.
- **Carbon credit markets and the policies underpinning them continue to evolve.** For example, the upcoming UNFCCC guidance on PACM registry requirements (see Section 4.13) will necessitate updates to the Data Model. Similarly, developments across compliance and voluntary markets—such as CORSIA, domestic schemes, and evolving VCM standards—will need to be reflected to ensure continued relevance.
- **The Data Model may also need to be updated to ensure it reflects needs of policymakers and market participants.** The initial version of the Data Model is built around a preliminary assessment of what data fields would ideally be standardised to support cross border trading and interoperability of carbon credit data systems across market participants. It is not informed by a detailed review of policies in every relevant country, or data fields captured by every market participant. This means the resource can—and should—be enriched in response to policymaker and market feedback to a competent body overseeing maintenance of the Data Model. Examples of potential feedback include:

    - **Picklist values**: these may need to be updated to reflect the latest regulations, or a complete set of latest technologies. For example, the methodology picklist may need extending on a regular basis to capture new crediting methodologies.
    - **Other information supplied by regulators:** in addition to data fields like 'methodology', the Data Model will require updating to reflect the latest decisions of regulators with respect to important variables, such as whether a carbon pricing scheme has eligibility criteria for carbon credits. As noted in Section 4.2.8, schemes that do not follow this approach are left out of the Data Model entirely, but the list may need updating over time. Regulators may also supply other sources of information that needs to be captured—for example, the name of a new national registry or carbon crediting programme.
    - **New fields**: as policy realities in countries change, new fields may need to be added to the resource. For example, if a new carbon pricing scheme is rolled out that national or sub-national regulators decide will accept high-integrity credits up to a pre-specified limit, a new eligibility label for the scheme would need to be added.

6.2 Proposed interim governance model

It is recommended that a suitable body be asked to oversee piloting and maintenance of the Data Model on an interim basis. This body would be responsible for managing the process of piloting and implementation over the next 12-18 months, with a potential review point for the G20 SFWG in 2027 (or on a different timescale preferred by the G20 SFWG). The body would require deep technical expertise in

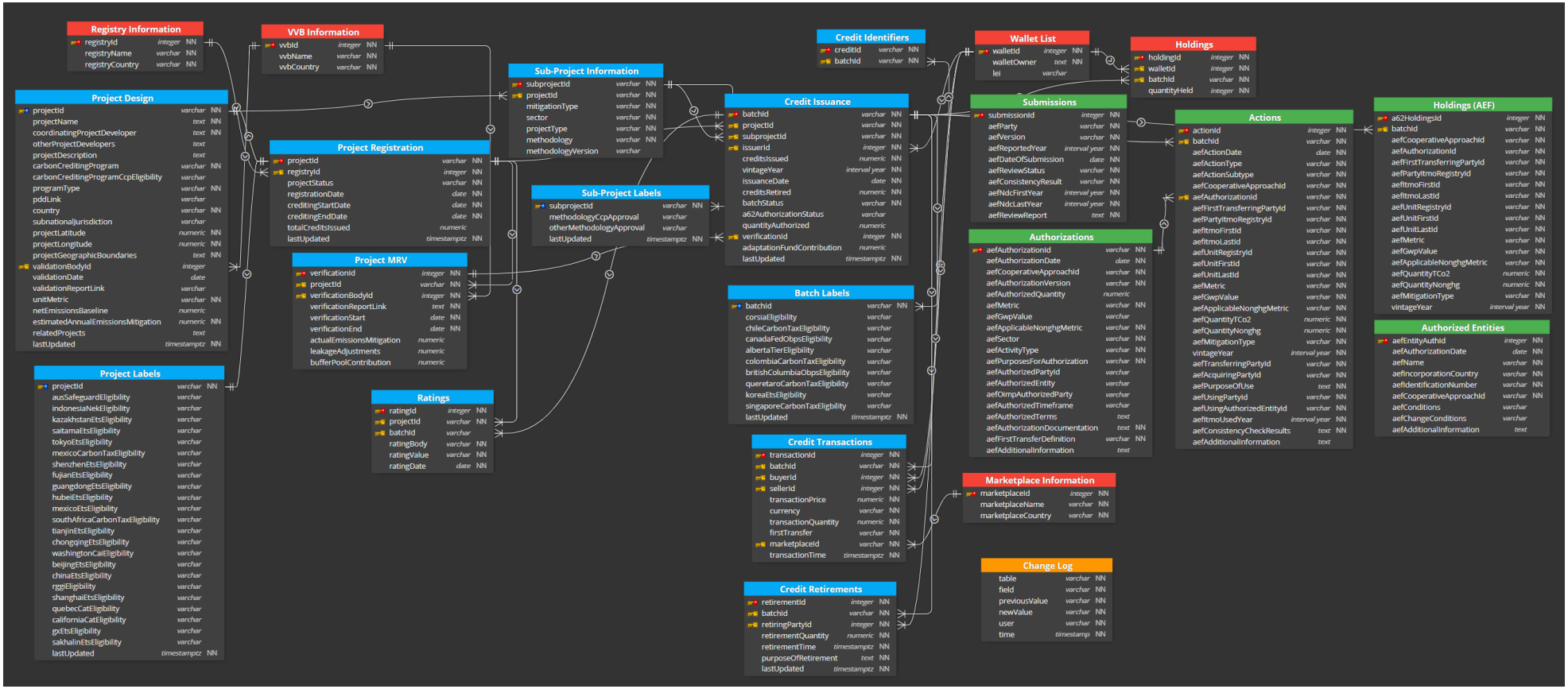
carbon markets and in building data systems and would be adequately resourced to engage in extensive stakeholder engagement.

The core responsibilities of such a governance body would include:

- **Planning and executing country and market participant pilots** as detailed in Section 5.2, including sharing lessons between pilots.
- **Developing clear processes for incorporating into the Data Model ongoing feedback** from national and regional policymakers, as well as market participants.
- **Adapting the resource to be consistent with PACM Registry** requirements when these are finalised by the UNFCCC Secretariat.
- **Assisting existing participants in the private sector and NGOs to map their existing data architecture** to the Data Model's suggested formats or move towards its full implementation.
- **Policies and procedures to prevent misuse of the resource**, for example, mislabelling of eligibility for carbon pricing schemes.
- **Coordinating with those providing capacity building during the piloting phase and planning for uptake post-2027** if the pilot phase is successful.
- **Developing a detailed proposal for longer term governance** and ownership of the resource, to be considered by the G20 SFWG.

It is likely that this body would need to be supported by a voluntary, independent working groups consisting of representatives from both the private and public sector to continue to iterate and develop the Data Model.

Annex A: Data Entity Diagram



Annex B: List of data fields and descriptions

B1. Baseline data tables

Table 1: Project Design

Data field name	Data field description
Project Identifier	Global unique identifier for the project
Project Name	Name of the project
Coordinating Project Developer	Name of the main project developer
Other Project Developers	Names of other project developers and entities involved in the project
Project Description	Short description of project
Carbon Crediting Program	Name of the carbon crediting program that currently hosts the project
Carbon Crediting Program CCP Eligibility	A label for whether the carbon crediting program (CCP) has been assessed as Core Carbon Principle-eligible by ICVCM
Program Type	Describes the scale of the accounting and verification framework of the mitigation activities: standalone project, nested project, or scaled up program at national (or sub-national) level
Project Design Document Link	Hyperlink to the pdf of the Project Design Document (PDD)
Country	Country in which the project is implemented
Sub-national Jurisdiction	Sub-national jurisdiction in which the project is implemented
Project Latitude	Latitude coordinate of the project reference point
Project Longitude	Longitude coordinate of the project reference point
Project Geographic Boundaries	Geospatial data file describing the project's spatial boundaries, e.g., Shapefile, KML, GeoJSON
Validation Body Identifier	Unique identifier for the independent third party conducting the validation for the project design
Validation Date	Date of issuance of the validation report by the independent third party conducting the validation of the project design

Validation Report Link	Hyperlink to the pdf of the validation report
Unit Metric	The unit metric used to assess the outcomes produced by the project
Net Emissions Baseline	Baseline of net annual emissions for the project
Estimated Annual Emissions Mitigation	Estimated annual emissions reduction, avoidance or removal
Related Projects	Project Identifiers of any projects that are related to this project
Last Updated	Time and date this row was last updated

Table 2: Project Registration

Data field name	Data field description
Project Identifier	Global unique identifier for the project
Registry Identifier	Unique identifier for the registry under which the project is registered
Project Status	Current status of the project
Registration Date	Date of registration, if project has been registered
Estimated Crediting Period Start	Start date for the estimated crediting period
Estimated Crediting Period End	End date for the estimated crediting period
Total Credits Issued	Total number of credits issued from this project
Last Updated	Time and date this row was last updated

Table 3: Project MRV

Data field name	Data field description
Verification Identifier	Unique identifier for the verification event
Project Identifier	Global unique identifier for the project
Verification Body Identifier	Unique identifier for the independent third party conducting the verification for the project outcome

Verification Report Link	Link to the verification report published by the VVB
Verification Period Start Date	Start date of the verification period
Verification Period End Date	End date of the verification period
Actual Emissions Mitigation	The amount of emissions mitigated by the project according to the verification event
Leakage Adjustments	The adjustment to the number of emissions mitigated required due to leakages
Buffer Pool Contribution	The amount of emissions added to any buffer pools from this project as decided by this verification event

Table 4: Ratings

Data field name	Data field description
Rating Identifier	Unique identifier for the rating event
Project Identifier	Global unique identifier for the project
Batch Identifier	Global unique identifier for the batch of credits issued
Rating Body	The organisation issuing the rating
Rating Value	The rating assigned to the project
Rating Date	Date rating was issued

Table 5: Project Labels

Data field name	Data field description
Project Identifier	Global unique identifier for the project
Eligibility for Australian Safeguard Mechanism	A label for whether credits issued under the project are eligible to be used as offsets under the Australian Safeguard Mechanism
Eligibility for Indonesia NEK Trading Scheme	A label for whether credits issued under the project are eligible to be used as offsets under the Indonesia NEK Trading Scheme

Eligibility for Kazakhstan ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Kazakhstan ETS
Eligibility for Saitama ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Saitama ETS
Eligibility for Tokyo ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Tokyo ETS
Eligibility for Mexico State-level Carbon Tax	A label for whether credits issued under the project are eligible to be used as offsets under the Mexico State-level Carbon Tax
Eligibility for Shenzhen Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Shenzhen Pilot ETS
Eligibility for Fujian Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Fujian Pilot ETS
Eligibility for Guangdong Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Guangdong Pilot ETS
Eligibility for Hubei Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Hubei Pilot ETS
Eligibility for Mexico Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Mexico Pilot ETS
Eligibility for South Africa Carbon Tax	A label for whether credits issued under the project are eligible to be used as offsets under the South Africa Carbon Tax
Eligibility for Tianjin Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Tianjin Pilot ETS
Eligibility for Chongqing Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Chongqing Pilot ETS
Eligibility for Washington Cap-and-Invest	A label for whether credits issued under the project are eligible to be used as offsets under the Washington Cap-and-Invest
Eligibility for Beijing Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Beijing Pilot ETS
Eligibility for China National ETS	A label for whether credits issued under the project are eligible to be used as offsets under the China National ETS
Eligibility for Regional Greenhouse Gas Initiative	A label for whether credits issued under the project are eligible to be used as offsets under the RGGI
Eligibility for Shanghai Pilot ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Shanghai Pilot ETS

Eligibility for Quebec Cap-and-Trade	A label for whether credits issued under the project are eligible to be used as offsets under the Quebec Cap-and-Trade
Eligibility for California Cap-and-Trade	A label for whether credits issued under the project are eligible to be used as offsets under the California Cap-and-Trade
Eligibility for Japan GX-ETS	A label for whether credits issued under the project are eligible to be used as offsets under the Japan GX-ETS
Eligibility for Sakhalin Oblast Pilot Crediting Mechanism	A label for whether credits issued under the project are eligible to be used as offsets under the Sakhalin Oblast Pilot Crediting Mechanism
Last Updated	Time and date this row was last updated

Table 6: Sub-Project Information

Data field name	Data field description
Sub-Project Identifier	Unique identifier for the subproject
Project Identifier	Global unique identifier for the project
Mitigation Type	The type of mitigation activity performed by the project
Sector	The sector in which the project is developed and the mitigation activities conducted
Project Type	Project type, representing a group of similar methodologies
Methodology	The methodology, approved by the hosting carbon crediting program, that is being used to evaluate, monitor, and verify the impact of the project
Methodology Version	The version of the methodology used

Table 7: Sub-Project Labels

Data field name	Data field description
Sub-Project Identifier	Unique identifier for the sub-project
Methodology CCP Approval	A label for whether the methodology has been assessed as Core Carbon Principle-approved by ICVCM

Other Methodology Approval (Policy-Based)	A label for whether the methodology has been assessed to be compliant with regulatory standards as determined by any other competent policymaker, at a national or regional level
Last Updated	Time and date this row was last updated

Table 8: Credit Issuance

Data field name	Data field description
Batch Identifier	Global unique identifier for the batch of credits issued
Project Identifier	Global unique identifier for the project
Sub-Project Identifier	Unique identifier for the subproject
Issuer Identifier	Unique identifier for the wallet receiving the credits at issuance
Credits Issued	Number of credits in the batch issued
Vintage	Calendar year in which mitigation outcome occurred
Issuance Date	Date on which the batch was issued
Credits Retired	Total number of credits retired from this batch
Batch Status	Indicates whether credits within the batch are active, retired, or cancelled
Article 6.2 Authorization Status	Current status of the Article 6.2 authorisation
Authorized Quantity	Maximum quantity of mitigation outcomes that are authorized for use towards an NDC and/or OIMP
Verification Identifier	Unique identifier for the verification event
Adaptation Fund Contribution	The number of credits that have been transferred into the Adaptation Fund from this batch of credits
Last Updated	Time and date this row was last updated

Table 9: Batch Labels

Data field name	Data field description
Batch Identifier	Global unique identifier for the batch of credits issued
Eligibility for CORSIA	A label for whether credits issued in this batch are eligible to be used as offsets under CORSIA Eligible Emissions Units—Phase 1
Eligibility for Chile Carbon Tax	A label for whether credits issued in this batch are eligible to be used as offsets under the Chile Carbon Tax
Eligibility for Canada Federal Output-Based Pricing System	A label for whether credits issued in this batch are eligible to be used as offsets under the Canada Federal Output-Based Pricing System
Eligibility for Alberta Technology Innovation and Emissions Reduction Regulation	A label for whether credits issued in this batch are eligible to be used as offsets under the Alberta Technology Innovation and Emissions Reduction Regulation
Eligibility for Colombia Carbon Tax	A label for whether credits issued in this batch are eligible to be used as offsets under the Colombia Carbon Tax
Eligibility for British Columbia Output-Based Pricing System	A label for whether credits issued in this batch are eligible to be used as offsets under the British Columbia Output-Based Pricing System
Eligibility for Queretaro Carbon Tax	A label for whether credits issued in this batch are eligible to be used as offsets under the Queretaro Carbon Tax
Eligibility for Korea ETS	A label for whether credits issued in this batch are eligible to be used as offsets under the Korea ETS
Eligibility for Singapore Carbon Tax	A label for whether credits issued in this batch are eligible to be used as offsets under the Singapore Carbon Tax
Last Updated	Time and date this row was last updated

Table 10: Credit Transactions

Data field name	Data field description
Transaction Identifier	Unique identifier for this specific transaction
Batch Identifier	Global unique identifier for the batch of credits issued
Buyer Identifier	Unique identifier for the wallet purchasing the credits
Seller Identifier	Unique identifier for the wallet selling the credits

Transaction Price	Price at which the transaction took place
Currency	Currency in which the transaction is denominated
Transaction Quantity	Quantity of credits traded in this transaction
First Transfer	Whether a first transfer of mitigation outcomes has been triggered as a result of this transaction
Marketplace Identifier	Unique identifier for the marketplace in which the credits were traded
Transaction Time and Date	Time and date of the transaction

Table 11: Credit Retirements

Data field name	Data field description
Retirement Identifier	Unique identifier for the specific retirement event
Batch Identifier	Global unique identifier for the batch of credits issued
Retiring Party Identifier	Unique identifier for the wallet retiring the credits
Retirement Quantity	Quantity of credits retired
Retirement Time and Date	Time and date of the retirement
Purpose of Retirement	The purpose for which the retirement took place
Last Updated	Time and date this row was last updated

B2. Article 6.2 Agreed Electronic Format data tables

Table 12a: Submission

Data field name	Data field description
Submission Identifier	Unique identifier for this specific submission
Party	Reporting Party as per common nomenclatures
Version	NA
Reported year	The annual period from 1 January to 31 December during which actions occurred

Date of submission	NA
Review status of the initial report	Review status as per paragraph 57 of latest Article 6.2 guidance.[40] This field is populated by the CARP as a result of the review of the initial report
Result of the consistency check of this AEF submission	Result of the consistency check as per paragraph 37 of latest Article 6.2 guidance.[41] Information in this field is populated by the CARP as a result of the consistency check procedure
First year of the NDC implementation period	NA
Last year of the NDC implementation period	NA
Reference to the Article 6 technical expert review report of the initial report	Hyperlink to the Article 6 technical expert review report of the initial report. This field is populated by the CARP as a result of the review of the initial report

Table 12b: Authorizations

Data field name	Data field description
Authorization ID	Authorization ID as assigned by the reporting Party
Date of authorization	Date on which the authorization was issued
Cooperative approach ID	Unique identifier of the cooperative approach as per common nomenclatures
Version of the authorization	NA
Authorized quantity	This field is optional. It may be used to specify the maximum quantity of mitigation outcomes that are authorized for use towards an NDC and/or OIMP
Metric	NA
Applicable GWP value(s)	If the mitigation outcome involves a non-CO_2 greenhouse gas(es), the global warming potential (GWP) value(s) applied, consistent with the relevant CMA decisions (e.g., '100-year values from 5th assessment report by the IPCC')

[40] See Decision 15a, and 15b, CMA.6, COP29 (2024)
[41] See Decision 15a, and 15b, CMA.6, COP29 (2024)

Applicable non-GHG metric	Type of non-GHG metric applied (e.g., megawatt hours of renewable electricity generation). This field should be reported as 'Not applicable' (NA) if the ITMOs are in a GHG metric
Sector(s)	Sector(s) in which the mitigation outcome occurred as per common nomenclatures
Activity type(s)	Description of the mitigation activity type(s) as per common nomenclatures
Purposes for authorization	Scope of authorisation of use of ITMOs (NDC, IMP, OP, OIMP)
Authorized Party(ies) ID	Parties may authorize mitigation outcomes for use by any Party or for a specific Party(ies). Where a Party(ies) is specified, the unique identifier of that Party(ies) is entered here as per common nomenclatures
Authorized entity(ies) ID	Unique identifier of the entities that are authorized as per common nomenclatures, if applicable
OIMP authorized by the Party	This field is only applicable if the authorization is for OIMP. This field specifies the other international mitigation purpose (OIMP), which may be an international mitigation purpose (IMP) or other purpose (OP). The specific purpose (e.g., use under the Carbon Offsetting and Reduction Scheme for International Aviation) is entered in this field
Authorized timeframe	This field is optional. It may be filled to specify the timeframe for which mitigation outcomes may occur (e.g., from 2021 to 2030) that are covered under the authorization and/or the time frame in which the mitigation outcomes may be used (e.g., from 2021 to 2030)
Authorization terms and conditions	This field is optional. It may be completed to specify the terms and conditions under which the authorization is provided
Authorization documentation	This field is automatically generated by the CARP and includes a hyperlink to the relevant documentation for this authorization
First transfer definition for OIMP	This field is only applicable to authorizations for use towards OIMP. This field specifies the first transfer definition used by the Party pursuant to decision 2/CMA.3, annex, para. 2(b). In other cases, this field is reported as 'Not applicable' (NA)
Additional explanatory information	This field is optional. The Party may use this field to provide any additional information

Table 12c: Actions

Data field name	Data field description
Action Identifier	Unique identifier for this specific action
Batch Identifier	Global unique identifier for the batch of credits issued
Action date	Date on which the action was executed in the Party ITMO registry
Action type	Action type as per decision 2/CMA.3, annex, para. 20(a)
Action subtype	NA
Cooperative approach ID	Unique identifier of the cooperative approach as per common nomenclatures
Authorization ID	Authorization ID as assigned by the reporting Party
First transferring participating Party ID	Unique identifier of the participating Party in which the authorized mitigation outcome occurred as per common nomenclatures
Party ITMO registry ID	Unique identifier of the Party ITMO registry in which the reported action has been tracked as per common nomenclatures
ITMO unique identifier First ID	Unique identifier of the ITMO as per decision 6/CMA.4, annex I, para. 5.— Refers to the first unique identifier of the ITMO block
ITMO unique identifier Last ID	Unique identifier of the ITMO as per decision 6/CMA.4, annex I, para. 5.— Refers to the last unique identifier of the ITMO block
Underlying unit registry ID	Unique identifier of the underlying cooperative approach registry as per common nomenclatures. This field should be reported as 'Not applicable' (NA) if the cooperative approach does not use an underlying cooperative approach registry
Underlying unit unique identifier - First unit ID	Unique identifier of the underlying unit from an underlying cooperative approach registry. This field should be reported as 'Not applicable' (NA) if the cooperative approach does not use an underlying cooperative approach registry. - Refers to the first unique identifier of the underlying unit block
Underlying unit unique identifier - Last unit ID	Unique identifier of the underlying unit from an underlying cooperative approach registry. This field should be reported as 'Not applicable' (NA) if the cooperative approach does not use an underlying cooperative approach registry. - Refers to the last unique identifier of the underlying unit block
Metric	NA
Applicable GWP value(s)	If the mitigation outcome involves a non-CO_2 greenhouse gas(es), the global warming potential (GWP) value(s) applied, consistent with the

	relevant CMA decisions (e.g., 100-year values from 5th assessment report by the IPCC)
Applicable non-GHG metric	Type of non-GHG metric applied (e.g., megawatt hours of renewable electricity generation). This field should be reported as 'Not applicable' (NA) if the ITMOs are in a GHG metric
Quantity (t CO2 eq)	Quantity of ITMOs in tonnes of CO_2e
Quantity (in non-GHG metric)	Quantity of ITMOs in the respective non-GHG metric. This field should be reported as 'Not applicable' (NA) if the ITMOs are in a GHG metric
Mitigation type	NA
Vintage	Calendar year in which the mitigation outcome occurred
Transferring participating Party ID	Unique identifier of the transferring participating Party or, where the transfer occurs from the Adaptation Fund to a Party, a unique identifier for the Adaptation Fund, as per common nomenclatures. This field is only applicable to the action type 'acquisition'. In other cases, this field is reported as 'Not applicable' (NA)
Acquiring participating Party ID	Unique identifier of the acquiring participating Party, or where the acquisition occurs by the Adaptation Fund, a unique identifier for the Adaptation Fund, as per common nomenclatures. This field is applicable to the action types: 'first transfer' and 'transfer'. In other cases, this field is reported as 'Not applicable' (NA)
Purpose for which the ITMO has been used towards or cancelled for OIMP	This field is completed to specify the purpose for which the ITMO has been first transferred for use towards international mitigation purposes (IMP), cancelled for other purposes (OP), or cancelled for purposes referred to in paragraph 20(a), annex, decision 2/CMA.3. This field is only applicable to the action types: 'use', 'first transfer', and 'cancellation'. In other cases, this field is reported as 'Not applicable' (NA)
Using/cancelling participating Party ID	Unique identifier of the using or cancelling participating Party as per common nomenclatures. This field is only applicable to report a use for IMP or cancellation for OP. In other cases, this field is reported as 'Not applicable' (NA)
Using/cancelling authorized entity ID	Unique identifier of the using or cancelling authorized entity as per common nomenclatures. This field is only applicable to report the use or cancellation of authorized mitigation outcomes or ITMOs by authorized entities. In other cases, this field is reported as 'Not applicable' (NA)
Calendar year for which the ITMOs are used towards the Party's NDC	The calendar year for which the ITMOs are used towards an NDC. This field is only applicable for use of ITMOs towards the Party's NDC. In other cases, this field is reported as 'Not applicable' (NA)

Result of the consistency checks	Shows the result of the consistency check on the reported action as per decision 2/CMA.3, annex, para. 33(a). Information in this field is populated by the CARP as a result of the consistency check procedure
Additional explanatory information	This field is optional. The Party may use this field to provide any additional information

Table 12d: Holdings

Data field name	Data field description
Holdings Identifier	Unique identifier for this specific holding
Batch Identifier	Global unique identifier for the batch of credits issued
Cooperative approach ID	Unique identifier of the cooperative approach as per common nomenclatures
Authorization ID	Authorization ID as assigned by the reporting Party
First transferring participating Party ID	Unique identifier of the participating Party in which the authorized mitigation outcome occurred as per common nomenclatures
Party ITMO registry ID	Unique identifier of the Party ITMO registry in which the ITMOs are held
ITMO unique identifier First ID	Unique identifier of the ITMO as per decision 6/CMA.4, annex I, para. 5.Refers to the first unique identifier of the ITMO block
ITMO unique identifier Last ID	Unique identifier of the ITMO as per decision 6/CMA.4, annex I, para. 5.—Refers to the last unique identifier of the ITMO block
Underlying unit registry ID	Unique identifier of the underlying cooperative approach registry as per common nomenclatures. This field should be reported as 'Not applicable' (NA) if the cooperative approach does not use an underlying cooperative approach registry
Underlying unit unique identifier - First unit ID	Unique identifier of the underlying unit from an underlying cooperative approach registry. This field should be reported as 'Not applicable' (NA) if the cooperative approach does not use an underlying cooperative approach registry—Refers to the first unique identifier of the underlying unit block
Underlying unit unique identifier - Last unit ID	Unique identifier of the underlying unit from an underlying cooperative approach registry. This field should be reported as 'Not applicable' (NA) if the cooperative approach does not use an underlying cooperative approach registry—Refers to the last unique identifier of the underlying unit block
Metric	NA

Applicable GWP value(s)	If the mitigation outcome involves a non-CO2 greenhouse gas(es), the global warming potential (GWP) value(s) applied, consistent with the relevant CMA decisions (e.g., '100-year values from 5th assessment report by the IPCC')
Applicable non-GHG metric	Type of non-GHG metric applied (e.g., megawatt hours of renewable electricity generation). This field should be reported as 'Not applicable' (NA) if the ITMOs are in a GHG metric
Quantity (t CO2 eq)	Quantity of ITMOs in tonnes of CO_2e
Quantity (in non-GHG metric)	Quantity of ITMOs in the respective non-GHG metric. This field should be reported as 'Not applicable' (NA) if the ITMOs are in a GHG metric
Mitigation type	NA
Vintage	Calendar year in which the mitigation outcome occurred

Table 12e: Auth. Entities

Data field name	Data field description
Entity Authorization Identifier	Unique identifier for this specific entity authorization
Date of the authorization	Date on which the authorization was issued
Name	NA
Country of incorporation	NA
Identification number	Identification number in the country of incorporation
Cooperative approach ID	Unique identifier of the cooperative approach as per common nomenclatures
Conditions	This field is optional. The conditions under which the authorization was provided, as applicable
Change and revocation conditions	This field is optional. Whether the authorization could be changed or revoked and under what conditions
Additional explanatory information	This field is optional. The Party may use this field to provide any additional information

Annex C: Implementation of unique identifiers and alignment with Article 6 ITMO identifiers

This Annex provides worked examples of how the proposed format and issuance process for unique identifiers in the Data Model could work in practice (see Section 4.2.1 for an introduction to suggested unique identifiers). These examples are not descriptions of existing policy and are strictly for the purposes of illustration.

Implementing this process would require piloting with a Suitably Qualified Body (SQB) in a willing jurisdiction, and/or designated entities for the tracking and recording of ITMOs in the relevant jurisdiction. It may require further refinement and testing with all parties concerned.

This annex illustrates implementation examples for both Voluntary Carbon Market (VCM) credits (Section C1) and credits transacted through Article 6.2 (Section C2).

C1. The role of the Suitably Qualified Body (SQB) in implementing the proposed system for unique identifiers

As noted in Section 4.2.1, there are several benefits to the proposed system of unique identifiers, including:

- Greater traceability for projects and batches;
- Reduced risk of double claiming, issuance, and retirement; and
- Easier tracking of mitigation outcomes in each jurisdiction, for market oversight or Nationally Determined Contribution (NDC) tracking purposes.

However, for these benefits to be realisable, it is necessary for key attributes to be managed, tracked, and stored centrally in each jurisdiction. It is therefore proposed that jurisdictions, in time, consider appointing an SQB for this purpose. The core responsibilities of the SQB would be as follows:

- **Issuing unique, four-digit, alphanumeric projects codes for carbon crediting projects in their jurisdiction**, and communicating these to the relevant project registry.
- **Managing the issuance of batch codes and central storing of batch identifiers**—this involves:
  - Supplying registries with unique, three-digit, alphanumeric batch codes for batches of credits that they issue.
  - Storing the consolidated, 12-digit batch identifier, with batch information included, centrally—alongside tonnes of CO_2e associated with that batch. Storing the emissions reductions associated with each batch is important for accommodating Article 6.2 ITMO identifiers, which is explained in Section C3.
- Issuing, as needed, codes to extend the 12-digit identifiers to sub-project and/or individual credits/units as needed, and communicating this information to the relevant registry.
  - The registry would be responsible for requesting sub-project codes from the SQB if these are necessary—for example, if a single project has multiple methodologies.
- In this instance, the registry would append the code 'SP' to the 12-digit identifier, and request a sub-project code from the SQB.
  - The SQB would supply a two-digit identifier for each sub-project, which the registry would then combine with the 12-digit identifier.

- In the example given in Section 4.2.1, the unique identifier provided was **CBGY12340016**. Thus, a sub-project within each batch could be identified as **CBGY12340016-SP01, CBGY12340016-SP02**, etc.
- Likewise, credit identifiers could be added by adding numeric digits to the end of the unique identifier to identify individual tonnes of CO_2e if required. These could be assigned directly to batches or sub-projects as needed. For example, **CBGY12340016-SP01-01, CBGY12340016-SP01-02**, etc.

Jurisdictions would have significant discretion as to who performs the role of SQB. The proposed unique identifier format is agnostic as to which institution has this role. However, several bodies that may already exist may be well suited to perform this function:

- Countries that already transact under Article 6.2 will have already empowered an institution to record and track ITMOs issued for use under the mechanism. For example, in Thailand it is the Thailand Carbon Credit Registry administered by Thailand Greenhouse Gas Management Organization.[42]
- Parties seeking to transact under the CDM previously, and under PACM in the future, are required to appoint and report a Designated National Authority (DNA) to the UNFCCC. More than 100 countries have already appointed a DNA. These are typically government ministries. For example, in Switzerland, the DNA is the Federal Office for the Environment.[43] These institutions, or a technical body sitting within them, could be empowered to act as the SQB.
- Jurisdictions may also have appointed a National Numbering Agency (NNA) under ISO 10992, the body responsible for issuing ISINs for securities in the relevant territory.[44] For example, the NNA for China is the China Securities Industry Standardization Technical Committee, while for Italy it is Banca d'Italia.

It is important to note that, at the discretion of the relevant jurisdiction, the SQB *could* be (but does not have to be) a registry. The steps set out above where the SQB shares information with registries would not be needed if the SQB performs the registry function itself.

C2. Worked example: unique identifiers for carbon credits that are not transacted through Article 6.2

The implementation of the proposed format for unique identifiers would require the collaboration of registries. These could be independent registries in the voluntary market or they could equally be creatures of policy such as national registries. For the sake of example, the process for generating the 12-digit identifier **CBGY12340016**, referred to in section 4.2.1, would be as follows:

- A project developer implementing a project in Guyana (GY) registers a project on any registry (R).
- R assigns the project an instrument code (CB), a country code (GY) and a check digit (6), following the proposed format for unique identifiers.
- R then requests a four-digit project code from Guyana's SQB.
- The SQB sets this code as '1234' and SQB communicates this to R—SQB also stores the code (1234) centrally in a database of issued project codes.
- Later, R decides to issue a batch of 7,144,662 tCO2e in a single batch; R requests a batch ID from the SQB and additionally informs the SQB that the batch contains 7,144,662 tCO2e.
- The SQB assigns a unique batch code (001) and communicates this to R.
- R combines these attributes into the 12-digit code CBGY12340016 and hosts this batch on the registry.
- The SQB stores the identifiers, including the project code, batch code, and associated emissions reductions/removals, as a single line item in a database.

[42] UNFCCC: Thailand's Article 6 initial report (2023).
[43] UNFCCC: DNAs.
[44] See Association of National Numbering Agencies.

As above, in the case that the SQB is *also* the registry on which the project is registered, the steps involving the sharing of information between the two parties would not be necessary. This process would need to be tested and refined with participating jurisdictions and registries in a pilot phase, as set out in Section 5.

C3. Worked example: unique identifiers for carbon credits that are transacted through Article 6.2

It is possible to implement the proposed unique identifier format without interfering with the unique ITMO identifiers under Article 6.2, as reflected in the negotiated reporting rules. This worked example assumes the same batch of credits described in C2 is additionally authorized as an ITMO under Article 6.2, purely for the purposes of illustration.

Step 1 – generating unique identifiers for carbon credits

This process would be identical to the one described in C2 above, until the batch of credits is issued on Registry R. Article 6.2 agreements that involve carbon credits historically have involved national registries (e.g., Thailand's agreement with Switzerland), but this need not necessarily be the case (for example, if countries enter partnerships with commercial or voluntary sector registries).

For the sake of example, if the batch of 7,144,662 tCO_2e is subsequently authorised as an ITMO, additional steps, as set out below, would need to be taken.

Step 2 – the generation of ITMO identifiers

Article 6.2 ITMO identifiers are generated combining information supplied by Parties to Article 6.2 agreements, and attributes supplied by the UNFCCC's Centralised Accounting and Reporting System (CARP). The first documentation that Parties to Article 6.2 Agreements must report to UNFCCC is known as the Initial Report. The requirement to submit the Initial Report is triggered when a Party becomes a Participating Party by authorising a cooperative approach per paragraph 18 of Decision 2/CMA.3.[45] The Initial Report must be submitted to UNFCCC no later than when the ITMO itself is authorised. UNFCCC guidance suggests that the Initial Report should contain the following four sections:

- The first section requires that Participating Parties confirm they fulfil the participation requirements for use of the Article 6.2 mechanism. This section typically includes a statement of which entity in the jurisdiction of the transferring party is responsible for the recording and tracking of ITMOs. For example, in the Article 6.2 agreement between Thailand and Switzerland, concerning the electrification of Bangkok's bus fleet, the responsible entity is the Thailand Carbon Credit Registry (TCCR) administered by Thailand Greenhouse Gas Management Organization.[46]
- The second section contains information about the Party's NDC, such as the target, types of target, and reference levels.
- The third section is concerned with emissions accounting and includes information on ITMO metrics; corresponding adjustments to be applied; and the method of quantification for the Party's NDC.
- The fourth section contains information specific to the cooperative approach, including authorisation by the participating party; expected mitigation per year of the cooperative approach; the countries involved.[47]

Upon submission of the Initial Report to UNFCCC, Parties to Article 6.2 Agreements will then receive several data points from the UNFCCC's Centralised Accounting and Reporting Platform (CARP)—**one of**

[45] UNFCCC: Report of COP (2021).
[46] UNFCCC: Thailand's Article 6 initial report (2023).
[47] UNFCCC: Reporting obligations.

which will be a unique ID for every ITMO. This information follows a specific format, known as the **Common Nomenclatures**.[48]

Article 6.2 ITMO IDs—each of which represent exactly 1tCO_2e—include information to identify the following:

- A number for the cooperative approach (e.g., CA0005).
- An identifier for the registry on which the cooperative approach is registered (e.g., ART).
- A two-digit code (following ISO-3166-1) to identify the country transferring the ITMO (e.g., GY for Guyana).
- Serial numbers for individual units (credits, e.g., 1, 2, 3…).
- Four numbers representing the vintage (e.g., 2021).

Therefore, the first ITMO in this batch would have the identifier **CA0005-ART-GY-1-2021**, the second **CA0005-ART-GY-2-2021**, and so on. Although this worked example is fictitious, these ITMO identifiers also relate in real life to two of 7,144,362 tCO_2e in jurisdictional REDD+ credits that Guyana authorised in February 2022 for use in the Article 6.2 mechanism.

These ITMO identifiers are then communicated with the **responsible entity** for tracking and recording ITMOs in each jurisdiction (e.g., TCCR in Thailand, the UNFCCC Focal Point in Guyana[49]). This body could also be the designated SQB in this proposed implementation model, but it need not be. This distinction will have implications for how mappings to Article 6.2 ITMO identifiers are stored and maintained (see Step 4 below).

Step 3 – mapping ITMO 'ranges' to the proposed format for unique identifiers

After Parties receive information—including ITMO IDs—from the CARP, the parties are required to submit annual information reports to the UNFCCC, following the Agreed Electronic Format (AEF).[50] Although ITMOs are identified at the 'unit' (or credit) level—in this example, '1' and '2' indicate individual units—the AEF requires that only the first and last ITMO ID of the relevant transaction be reported in the AEF, in both the 'holdings' and 'actions' tables.

This step is important, as it means the proposed universal format for unique identifiers does <u>not</u> require an extension to the credit level be mappable for the Article 6.2 format.

As an illustrative example, consider Guyana's submission to UNFCCC in April 2025, using the AEF format. The extract below from the 'actions' table shows that only a *range* of ITMOs is required for reporting purposes. In this case, the range of ITMOs reported is **1 – 7,144,362**.

[48] UNFCCC: List of common nomenclature under Article 6.
[49] UNFCCC: Guyana's Article 6 initial report (2024).
[50] See Decision 15a, and 15b, CMA.6, COP29 (2024).

Figure 9 – Extract from Guyana's Annual Submission to UNFCCC[51]

ITMO							
					Unique identifiers		
					Underlying units		
			ITMO unique identifier			*Underlying unit unique identifier*	
Authorization ID	*First transferring participating Party ID*	*Party ITMO registry ID*	*First ID*	*Last ID*	*Underlying unit registry ID*	*First unit ID*	*Last unit ID*
GUY 2024-CA1	*GUY 2024-CA1*	*GUY 2024-CA1*	CA0005-ART-GY-1_2021	CA0005-ART-GY-7,144,362-2021	ART 102	ART-GY-102-2021-11-1	ART-GY-102-2021-11-7,144,362

The extract above is an illustrative example of a unique ID in the Data Model's proposed format: namely, **CBGY12340016** (see section 4.2.1). As indicated, SQBs in each jurisdiction would be responsible for generating a mapping of the proposed unique identifier format to the Article 6.2 ITMO unique ID format.

Because the AEF only requires a range to be reported, this group of ITMOs could be considered as analogous to a 'batch' of credits issued. This means the mapping between the proposed format for unique identifiers and the AEF reporting requirements, is as follows:

CA005-ART-GY-1-7,144,362-2021 → CBGY12340016

Step 4 – maintaining and storing the mappings

In the illustrative example in C2 above, the SQB is responsible for storing and recording unique project codes, batch codes, and emissions reductions or removals associated with each batch. In this worked example, the SQB would have the additional responsibility of recording a corresponding ITMO range, per the format in the AEF, in the same database line item.

The process would differ slightly depending on whether the SQB is *also* the responsible entity for tracking and recording ITMOs under Article 6.2 (see Step 1):

- If the SQB is also the responsible entity then no further sharing of information is required, as the SQB would have already received the relevant ITMO identifiers from the CARP. Its task in this instance would be to record the ITMO range reportable in the AEF against the attributes (project identifier, batch identifier, quantify of emissions reductions/removals it is already storing).
- If the SQB is not also the responsible entity, then the responsible entity would need to additionally send the SQB the mapping between the 12-digit unique identifier and the ITMO range reportable under the AEF. The SQB would then need to store the information as above.

At the discretion of policymakers in the relevant jurisdiction, SQBs could also consider publishing mappings to Article 6.2 ITMO ranges. This would allow market participants and policymakers to easily match unique identifiers in the proposed format to ITMOs under Article 6.2, which would be beneficial for transparency purposes.

As noted in Section 4.2.1, these processes would need to be piloted and implemented with willing jurisdictions and registries before being rolled out in multiple countries over the longer term.

[51] Source: UNFCCC, Article 6.2 Annual Information Reports, last accessed 19 May 2025.

Annex D: List of consultation questions

The consultation asks questions in the following sections:

- **Section A** – Information about respondents including name, organization, region etc.
- **Section B** – Key Questions: Respondents' experience of data standardisation across carbon markets, and broad views on the overall approach taken to Data Model development—including on scope, structure, and key data fields, such as unique identifiers—as well as adoption, implementation, and governance of the Data Model.
- **Section C** – Detailed Design Questions on the technical design of the Data Model, including in relation to its structure, format, parts of the carbon credit life cycle covered and treatment of key data fields.

PART A – Respondent details

In this section you will be asked for some basic identifying information.

1. **Name:**

2. ***Email address:**

3. ***Name of organization or institution:**

4. ***What country or region does your organisation or institution primarily represent or operate in?**
   (If your organisation's work is global, please write 'global')

5. **What type of institution do you represent?**

   - Government agency or regulator
   - International organisation or standard setter
   - Specialised carbon markets standard setter
   - Private-sector institution - investor
   - Private-sector institution - project developer
   - Private-sector institution - registry
   - Private-sector institution - rating agency
   - Private-sector institution - trading exchange
   - Private-sector institution - carbon credit buyer
   - Private-sector institution - other market intermediary
   - Civil society group
   - Individual respondent
   - Other

6. **Are you happy to be contacted if we identify follow-up points for discussion?**

7. **All responses will be made available on the CDSC website unless otherwise indicated. Are you content for your response to be made available?**

SECTION B – Key Questions

This section consists of high-priority, high-level questions covering both the technical specifications of the model as well as the potential delivery model. Respondents have the option to exit the survey after this section, or to provide more detailed feedback on the technical specifications of the Data Model in Section C.

1. **What has been your experience of data standardisation (or lack thereof) in carbon credit markets? How has this impacted your ability or willingness to support the development of, or participation in, these markets? Please share any relevant examples or case studies.**

2. **Has the scope of the Data Model been appropriately defined, noting that it includes all carbon credits (including those transacted under Article 6), and excludes non-credit based cooperation under Article 6 and emissions trading system allowances (further detail is available in Section 2.2 of the Technical Consultative Note (the Note)?**

3. **Have the key benefits and use cases of the Data Model been accurately captured in Section 2.3 of the Note? Are there additional benefits and use cases that are not captured in the Note?**

4. **Given accessibility is a guiding principle, is a spreadsheet a suitable format for the Data Model? Are there any additional resources required to support implementation of the suggested approaches to data standardisation (e.g., a user manual, workshops or worked examples)?**

5. **Each table in the Data Model relates to a stage of the carbon credit life cycle. Does this approach to structuring the Data Model meet your needs as a user? If not, what alternative approaches would you suggest?**

6. **Does the Data Model capture all the necessary data fields to support a minimum baseline for data standardisation and are the right data fields included in the right tables?**

7. **Section 4.2.1 of the Note outlines a proposal to introduce a system of ecosystem-wide unique identifiers to support market integrity and reduce the risk of double counting. Do you have a view on this proposal? Do you have feedback on the design of the identifiers, including the focus on batch-level identifiers (versus credit-level identifiers)? Do you have feedback on the implementation of a system of unique identifiers, including on a suitable body that could issue identifiers?**

8. **Do you have a view on the suggested approach to the following design choices outlined in Section 4 of the Note? This includes, but is not limited to, the approach to:**

    a. Capturing the fact that a single project might deploy multiple methodologies or span multiple regions through the use of sub-project tables (see Section 4.1.1 of the Note)
    b. Integrating the Authorized Electronic Format (AEF) for Article 6 reporting (see Section 4.1.3 of the Note)
    c. Applying Eligibility labels for credits that policymakers have deemed eligible for use in carbon pricing mechanisms (see Section 4.2.8 of the Note). "*These fields are designed to capture eligibility in a strictly factual manner, if and where it exists. Where market participants do record eligibility in their own data, the Data Model seeks to facilitate their doing so in a consistent and transparent manner.*
    The Data Model is not a tool to influence substantive policy decisions for what credits—if any—are eligible for regional, national, or sub-national carbon pricing schemes. Such schemes may have eligibility restrictions, including (but not limited to) region of origin requirements, that are

decided solely at the discretion of relevant regulators and not captured here. Labels only capture eligibility that has been decided by regulators and project developers will not be able to state eligibility of their own projects or credits". The inclusion of specific labels at either the sub-project, project, or batch level does constitute an endorsement of underlying eligibility requirements, nor is it intended to foreground specific labels over others.

d. Capturing the purpose of retirement and potential picklist values for this data field, if a picklist is desirable (see Section 4.2.9 of the Note)

9. **Are the adoption levers identified in Section 5 of the Note comprehensive and appropriate? Are there additional levers that could support model adoption?**

10. **Are there specific barriers to adoption that you believe the pilot phase should anticipate and seek to address?**

11. **Do you agree with the phased implementation plan—beginning with targeted pilots for 12-18 months—to test the Data Model and identify what refinement is needed? Do you have suggestions of which jurisdiction[s] would be best placed to participate in such a pilot phase?**

12. **Are the three focus areas for the pilot phase—implementation of unique identifiers; testing with national and independent registries; and incorporation of any additional Article 6 guidance—the right ones? Are there any additional priority areas to be tested?**

13. **Do you have any feedback on the delivery model for such a piloting phase?**

14. **If applicable, how aligned is your current data management approach to this model? Would you be interested in participating in a pilot?**

15. **Do you have any other comments or feedback on the Technical Consultative Note or Data Model that you'd like to share?**

OPTIONAL SECTION C – Do you want to provide more detailed feedback on the technical specifications of the Data Model?

SECTION C – Technical questions

1. **The Data Model contains the following categories of tables:**

   a. Baseline tables related to the carbon credit lifecycle
   b. Article 6 tables replicating the Authorized Electronic Format (AEF)
   c. Illustrative auxiliary tables, and
   d. A metadata table

   This structure is detailed in Section 3.2 and illustrated in Figure 7 of the Note. Given the illustrative nature of the auxiliary and metadata tables, and that the AEF is governed by the UNFCCC, please provide feedback on the baseline tables.

   Do the baseline tables link to each other appropriately, and are primary and reference keys through which they link appropriately designed?

2. **Are data field descriptions sufficiently clear?**

3. **Are fields correctly noted as static or changing?**

4. **The Data Model is designed around a principle of data normalisation—which requires that every cell has a unique value, and every record be unique wherever possible—however, within a given project, there may be data fields that require capturing multiple values. For example, a single project may deploy multiple methodologies.**

   To address these challenges, the Data Model uses picklists wherever possible, and for key project-related variables introduces a Sub-Project Information data table to capture variables that can be recorded more than once within a single project.

   Do you agree overall with this approach? Do the variables captured in the Sub-Project Information data table, namely, 'project type', 'methodology', 'sector', and 'mitigation type', adequately capture data fields within the same project that may require recording multiple values?

5. **Do you agree with the picklist values included in the Data Model? Are there any data fields that, in your view, should have a picklist but currently do not? Do the values assigned to picklists strike an appropriate balance between the need for granular information and flexibility versus the need to allow meaningful aggregation of data if users require this?**

6. **The Data Model replicates the Article 6 Authorized Electronic Format (AEF) in order to maximise alignment with UNFCCC reporting guidance. Do you agree with this choice? Would it be helpful for the Data Model to more fully integrate AEF data fields in other baseline tables? Finally, where AEF fields are included in the baseline Data Model, have they been recorded in the correct place?**

7. **What do you see as the potential benefits of a common approach to unique identifiers in carbon credit markets?**

8. **Is a batch level identifier sufficiently granular for most use cases? What use cases would require a credit-level identifier?**

9. **Section 4.2.1 of the Note lays out, in detail, the rationale for the proposed unique identifier format and the attributes that are captured within it (versus elsewhere in the Data Model). Do you agree with this approach or should other attributes be captured in the proposed unique identifier format?**

10. **Section 4.2.1 of the Note sets out an approach to implementing unique identifiers, through Suitably Qualified Bodies (SQBs) in willing pilot jurisdictions. Do you have any feedback on this proposed approach?**

11. **The activities that generate carbon credits can range from individual projects to programs that cover entire jurisdictions or sectors (see Section 4.2.2 of the Note for further details). Does the Data Model adequately reflect the possible types of programs or is more granularity needed?**

12. **Carbon crediting projects can theoretically span multiple geographies—however, emission reductions typically need attribution to single countries. The Data Model therefore recommends splitting these projects into two entries, one for each country. The two entries would have the same unique identifier and their relationship would be captured in the 'related projects' data field (see Section 4.2.3 of the Note for further details).**

    Does this approach make sense for balancing the need to attribute emissions reductions to single

countries against the need to avoid multiplicity of responses in the Data Model? Are you satisfied that the 'related projects' field is sufficient to identify these multi-country projects?

13. **The Data Model proposes using ISICs Division level (01-99) to capture information related to the sectoral classification of the project.**

    Does the ISIC Division level provide sufficient granularity for capturing key differences between project types? Are there any alternative internationally recognised and widely applied classifications of economic activity that could also be considered?

14. **Are the picklist values provided for 'project type' and 'methodology' in the Data Model comprehensive? Are there any methodologies that you do not think can be categorised into one of the project types?**

15. **Do you have suggestions on what process could be followed for maintaining the project type and methodology picklists? In particular, feedback on methodologies approved by national regulators or carbon crediting programs is welcome.**

16. **There is increased recognition that precise geographical boundaries are required for accurate emissions accounting. The Data Model therefore suggests a multi-tiered approach to recording location data, including spatial data specifications (see Section 4.2.6 of the Note for further detail).**

    Is this approach sufficient? Are there additional standardised geographic data indicators that you would like to see included in the Data Model?

17. **The Data Model does not propose a specific file format for files that capture geographical boundaries (see Section 4.2.6 of the Note). Do you agree with this approach, and if not, would you recommend a particular file type to be included?**

18. **The Data Model is limited to MRV fields that are standardisable across project types, noting the potential for future enrichment of the resource in the future (see Section 4.2.7 of the Note for further detail). What additional fields, including Digital MRV (dMRV) fields, could be prioritised for future iterations of the Data Model, that are standardisable across different project types? How can standardisation across project types be encouraged?**

19. **Buyers of credits have indicated that eligibility labels—which identify credits policymakers have deemed eligible for limited use in their carbon pricing systems—are of value to them and will help to simplify purchasing decisions.**

    Do you agree with including these labels in the Data Model?

    *Disclaimer - *"These fields are designed to capture eligibility in a strictly factual manner, if and where it exists. Where market participants do record eligibility in their own data, the Data Model seeks to facilitate their doing so in a consistent and transparent manner.*
    The Data Model is not a tool to influence substantive policy decisions for what credits—if anyare eligible for regional, national, or sub-national carbon pricing schemes. Such schemes may have eligibility restrictions, including (but not limited to) region of origin requirements, that are decided solely at the discretion of relevant regulators and not captured here. Labels only capture eligibility that has been decided by regulators, and project developers will not be able to state eligibility of their own projects or credits".

The inclusion of specific labels at either the sub-project, project, or batch level does constitute an endorsement of underlying eligibility requirements, nor is it intended to foreground specific labels over others.

20. **The Data Model includes individual fields for eligibility labels for each carbon pricing mechanism because some credits may be eligible for more than one scheme. This is why a single picklist of eligibility labels is not feasible. The Data Model currently includes individual eligibility labels, recorded in the project, sub-project, or batch tables, as appropriate.**

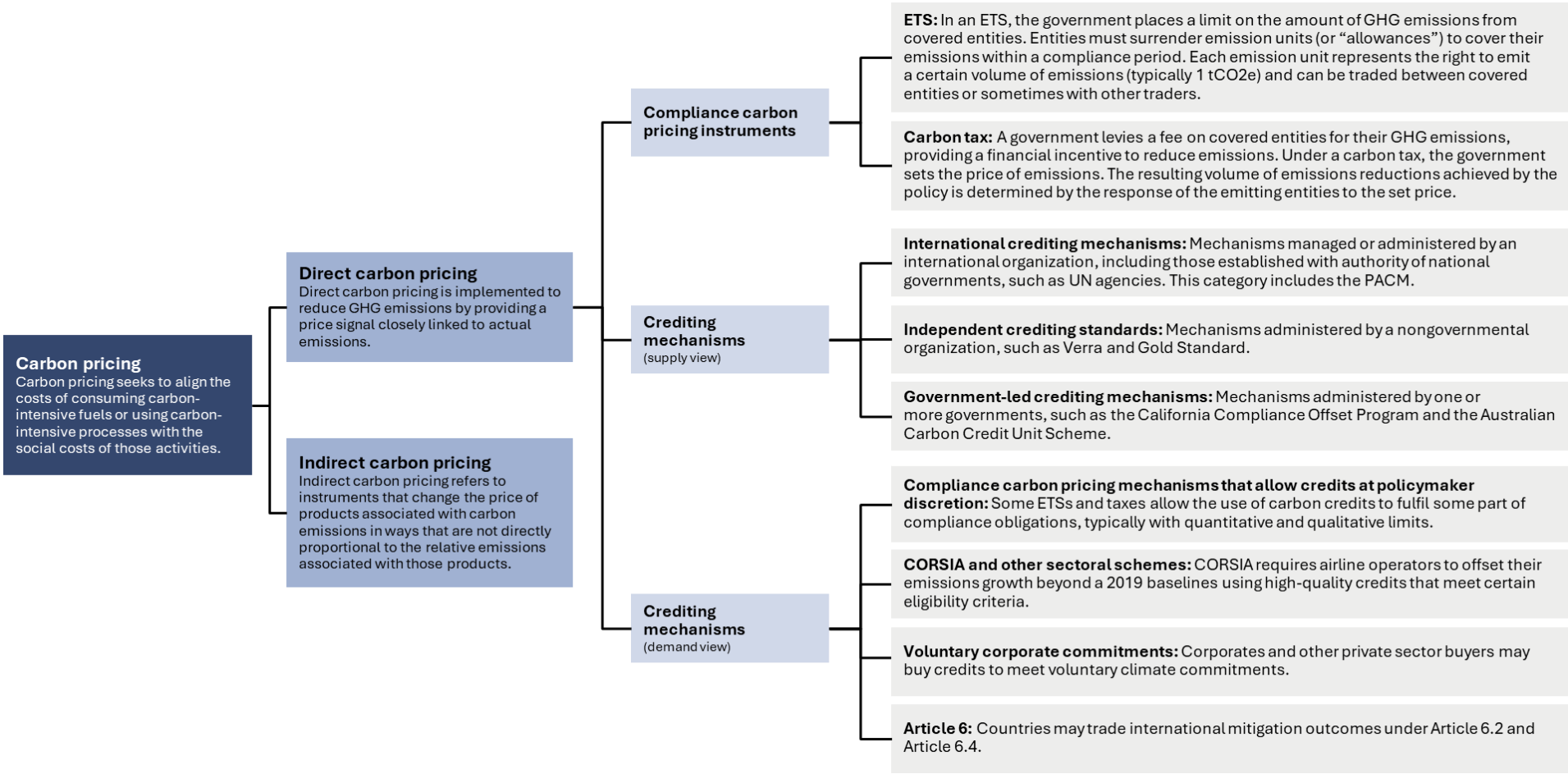
    Do you agree with this approach, or are there more efficient alternatives? Do you foresee any challenges in applying this approach?

21. **Given the variety of use cases of credits, the Data Model recommends a free-form text field to capture the purpose of retirement. Do you agree with this approach, or would you prefer to see additional standardisation within the Data Model via a picklist? If incorporating a picklist is preferred, what values would you suggest including in the picklist?**

22. **Are there further data fields that are needed to capture the ultimate 'beneficiaries' of retirements (if, for example, credits are retired by a broker or market marker on behalf of someone else)?**

Annex E: Terminology and abbreviations

This Technical Consultative Note adheres to the carbon pricing terminology set out in the World Bank State and Trends of Carbon Pricing Report (2025). A summary diagram of terms is provided below.



Source: Based on the World Bank State and Trends of Carbon Pricing Report (2025)

Table of Abbreviations

AEF	Agreed Electronic Format
BECCS	Bioenergy with Carbon Capture and Storage
CAD Trust	Climate Action Data Trust
CARP	Centralised Accounting and Reporting System
CCC	Common Carbon Credit
CCPs	Core Carbon Principles
CDOP	Climate Data Open Protocol
CDSC	Climate Data Steering Committee
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
dMRV	Digital monitoring, reporting, and verification
DNA	Designated National Authority
EMDE	Emerging Market and Developing Economies
ETS	Emissions Trading Systems
GHG	Greenhouse Gas
GWP	Global Warming Potential
ICAO	International Civil Aviation Organization
ICVCM	Integrity Council for the Voluntary Carbon Market
ICVCM CIWP 7	Integrity Council for the Voluntary Carbon Markets Continuous Improvement Work Programme 7
IMP	International Mitigation Purpose
IOSCO	International Organization of Securities Commissions
ISIC	International Standard Industrial Classification
ISIN	International Securities Identification Number
ISO	International Organization for Standardization
ITMOs	Internationally Transferred Mitigation Outcomes
LEAF Coalition	Lowering Emissions by Accelerating Forest finance
MDBs	Multilateral Development Banks
MECE	Mutually Exclusive and Collectively Exhaustive
MRV	Monitoring, Reporting, and Verification
NCQG	New Collective Quantified Goal
NDCs	Nationally Determined Contributions
NGOs	Non-Governmental Organisations
NNA	National Numbering Agency
NZDPU	Net-Zero Data Public Utility
OIMP	Other International Mitigation Purpose
OP	Other Purpose
PACM	Paris Agreement Crediting Mechanism
PDD	Project Development Document
PWG	Policy Working Group
RGGI	Regional Greenhouse Gas Initiative
SFWG	Sustainable Finance Working Group
SQB	Suitably Qualified Body
UNFCCC	United Nations Framework Convention on Climate Change
VCM	Voluntary Carbon Market
VVBs	Validation and Verification Bodies
WB CMI WG	World Bank's Carbon Markets Infrastructure Working Group