

Briefing 2: Transactions on Forest Carbon

How forest carbon is bought, sold and paid for in compliance markets, voluntary markets, and Ghana's arrangements

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This briefing in brief

- **Forest carbon is monetised through transactions:** results-based payment agreements, credit sales and country-to-country transfers, in two broad market families: compliance markets created by law, and voluntary markets driven by corporate climate commitments.
- **Ghana already transacts in both.** It has earned over USD 21 million in results-based REDD+ payments under its agreement with the World Bank's Forest Carbon Partnership Facility, secured Green Climate Fund finance for the Shea Landscape project, and is among the first African countries to operationalise Article 6 of the Paris Agreement through bilateral agreements, beginning with Switzerland.
- **Every transaction follows a regulated pathway:** Forestry Commission buy-in, EPA engagement, a validated design document, a Letter of Authorisation, and registration in the Ghana Carbon Registry before credits can be issued or transferred.
- **The main legal risks are transactional:** double counting where projects overlap with Ghana's jurisdictional REDD+ programme, unclear rules for "nesting" projects, communities' weak bargaining position, and the absence (pending the Carbon Markets Regulations) of detailed binding rules.
- **This briefing complements Briefing 1,** which addresses who owns forest carbon. Here the focus is on how it is traded, and what Ghana should do to make those trades credible, equitable and safe for its national climate accounts.

1. Introduction: what is traded, and how?

Briefing 1 examined who owns the carbon stored in Ghana's forests. This briefing addresses the next question: how that carbon is turned into money. A "forest carbon transaction" is any arrangement under which the climate benefit of conserving, restoring or planting forests, measured in tonnes of carbon dioxide equivalent (tCO₂e) reduced or removed, is exchanged for value. The thing transferred is intangible: a verified emission reduction or removal, usually packaged either as a carbon credit (a tradeable certificate representing one tonne of CO₂e, issued by a registry against a recognised standard) or as a results-based payment (money paid by an agreed formula per verified tonne, without necessarily issuing tradeable units) (MSCI, 2024; Vernet, 2025).

In practice, forest carbon transactions take a small number of recurring legal forms:

1. **Emission Reductions Payment Agreements (ERPAs):** contracts under which a buyer (often a multilateral fund) agrees to pay a fixed price per verified tonne delivered by a programme, as in Ghana's agreement with the World Bank's Forest Carbon Partnership Facility.
2. **Sales of verified carbon credits :** spot or forward sales of credits issued under voluntary standards (e.g. Verra's VCS, Gold Standard, ART-TREES) to corporate or institutional buyers, directly or through brokers and marketplaces.
3. **International transfers between states (ITMOs):** transfers of mitigation outcomes authorised by the host country to a buyer country under Article 6.2 of the Paris Agreement, accompanied by corresponding adjustments to national accounts.
4. **Grant-funded results-based programmes:** climate finance (e.g. from the Green Climate Fund) disbursed against project milestones and verified emission reductions, without credit issuance to the funder.

Which form a transaction takes depends largely on which market it serves. The next two sections explain the two market families, compliance and voluntary, in plain terms, before section 4 turns to Ghana's own participation and arrangements, and section 5 offers recommendations. Throughout, matters of ownership, attribution and benefit-sharing are cross-referenced to Briefing 1 rather than repeated.

2. Compliance Markets

2.1. What makes a market “compliance”

Compliance carbon markets are created by law: a government or treaty body caps the emissions of regulated entities and obliges them to surrender allowances or eligible credits for every tonne they emit. Demand is therefore mandatory, not discretionary. The archetype is the emissions trading system (ETS), or “cap-and-trade” market: the regulator sets a declining cap, allocates or auctions allowances within it, and lets regulated firms trade. The European Union ETS, about 87 per cent of global ETS value, and California's Cap-and-Trade Program are the leading examples; allowance prices in such systems have run far above

voluntary credit prices, which averaged around USD 6.5 per tonne in 2023 (World Bank, 2023; Vernet, 2025). Most ETSs are domestic or regional and generally do not accept international forest credits, which limits their direct relevance to Ghanaian forest carbon, although a growing number of emerging-economy schemes are considering domestic offset windows (Johnstone et al., 2025).

2.2. The treaty-based mechanisms: Kyoto, Paris Article 6 and CORSIA

A second family of compliance instruments operates between countries. Under the Kyoto Protocol's Clean Development Mechanism (CDM), industrialised countries met part of their targets by buying Certified Emission Reductions from projects in developing countries; afforestation and reforestation qualified, but REDD+ did not, which is why avoided-deforestation credits historically grew up in the voluntary market.¹ The CDM has been superseded by Article 6 of the Paris Agreement, which creates two channels. Article 6.2 is decentralised: two countries agree bilaterally that mitigation outcomes achieved in one (the "host") may be transferred to the other as internationally transferred mitigation outcomes (ITMOs), to count toward the buyer's nationally determined contribution (NDC) or other international purposes. Article 6.4 establishes a centralised, UNFCCC-supervised crediting mechanism, the Paris Agreement Crediting Mechanism (PACM), through which both states and companies will be able to transact; its rules were completed at COP29 in Baku in November 2024 (MSCI, 2024).²

Two design features matter greatly for forest carbon sellers. First, authorisation: an ITMO exists only if the host state formally authorises the transfer, in Ghana, through the Letter of Authorisation process described in section 4 below. Second, the corresponding adjustment: to prevent double counting, the host country must add the transferred tonnes back onto its own books, effectively giving up the right to count them toward its NDC.³ For a forest country like Ghana, every authorised export of forest carbon is thus also a decision about how much of its cheapest mitigation it sells rather than keeps, a strategic trade-off explicitly managed in

¹Kyoto Protocol to the United Nations Framework Convention on Climate Change (1997), art 12. The CDM issued Certified Emission Reductions (CERs); no new CDM projects have been registered since the Paris regime took over from 2020, although legacy CERs remain in circulation.

²Paris Agreement (2015), art 6.2 (cooperative approaches involving internationally transferred mitigation outcomes) and art 6.4 (the centralised crediting mechanism, now styled the Paris Agreement Crediting Mechanism (PACM)). The detailed rules for both were completed at COP29 in Baku in November 2024.

³A "corresponding adjustment" is an accounting entry by which the host country adds the transferred emission reduction back to its own national greenhouse gas account, so that the same tonne is not counted by both the seller and the buyer towards their climate targets.

Ghana’s framework through eligibility “white lists” and activities reserved for the national NDC (Ghana Carbon Market Office, 2022).

Finally, CORSIA, the Carbon Offsetting and Reduction Scheme for International Aviation, is a sectoral compliance scheme under which international airlines must offset emissions growth using eligible credits. Because CORSIA accepts high-integrity, corresponding-adjusted credits, including certain forest credits (notably ART-TREES jurisdictional REDD+ units), it is expected to be a significant source of compliance demand for forest carbon from countries like Ghana (MSCI, 2024).

Market / mechanism	Unit traded	Who must / may buy	Relevance to Ghanaian forest carbon
Emissions trading systems (EU ETS, California, etc.)	Allowances (quotas)	Entities regulated by the cap	Indirect only - most ETSs do not accept international forest credits.
Kyoto CDM (legacy)	Certified Emission Reductions (CERs)	States and firms with Kyoto-era obligations	Closed to new projects; REDD+ was never eligible. Historical interest only.
Paris Article 6.2	Internationally Transferred Mitigation Outcomes (ITMOs)	States (bilateral agreements); authorised private use	High - Ghana’s bilateral agreements (e.g., Switzerland) run through this channel; forest programmes can generate ITMOs if authorised.
Paris Article 6.4 (PACM)	A6.4 Emission Reductions (A6.4ERs)	States and companies	Emerging -a future channel for Ghanaian forest credits once methodologies are approved.
CORSIA	Eligible Emission Units (EEUs)	International airlines	Growing - jurisdictional REDD+ units (ART-TREES) are CORSIA-eligible,

Market / mechanism	Unit traded	Who must / may buy	Relevance to Ghanaian forest carbon
			relevant to Ghana's LEAF engagement.
Voluntary carbon market (s 3 below)	Verified Emission Reductions (VERs)	Anyone - mainly corporates	High - the historical home of forest carbon, including REDD+ credits.

Table 1. The main carbon market segments, their units and their relevance to Ghana (adapted from Vernet, 2025; MSCI, 2024).

3. Voluntary Markets

3.1. How the voluntary market works

The voluntary carbon market (VCM) exists because companies, institutions and individuals choose to pay for emission reductions they are not legally required to make, typically in support of corporate climate commitments, ESG strategies or claims of carbon neutrality. There is no statute behind the demand; instead, private standard-setters supply the rule-book. A project developer designs a project under a recognised standard, the largest being Verra's Verified Carbon Standard and the Gold Standard, with ART-TREES and Plan Vivo prominent for forests and communities, and an independent validation and verification body (VVB) audits it. The standard's registry then issues verified emission reductions (VERs), which the developer sells to buyers directly, through brokers, or on marketplaces; the buyer ultimately "retires" the credit to claim its climate benefit (MSCI, 2024; Vernet, 2025).

Whatever the standard, a credible credit must satisfy five tests: additionality (the project would not have happened without carbon finance); permanence (the carbon stays out of the atmosphere, a particular challenge for forests, addressed through buffer pools of unsold credits held against fire, pests and illegal logging); no leakage (deforestation is not simply displaced elsewhere); no double counting (one tonne, one claim); and co-benefits (positive impacts beyond carbon, such as biodiversity and livelihoods) (Vernet, 2025).

3.2. Integrity pressures and prices

The VCM has been through a turbulent period. Investigations from 2023, most prominently a Guardian analysis questioning the additionality of a large share of avoided-deforestation credits issued under older REDD+ methodologies, depressed prices and demand for forest

credits and accelerated reform (Greenfield, 2023). Two integrity initiatives now frame the market’s recovery: the Integrity Council for the Voluntary Carbon Market (ICVCM), whose Core Carbon Principles label assesses the supply side (the quality of credits), and the Voluntary Carbon Markets Integrity Initiative (VCMI), which governs the demand side (what claims companies may make when using credits). Average VCM prices remain modest, around USD 6.5 per tonne in 2023, with an oversupply of older credits, but high-integrity removals and jurisdiction-scale forest credits command significant premiums, and Article 6-authorized credits are forecast to trade far higher (MSCI, 2024; World Bank, 2023).

For host countries and communities, the documented risks of the VCM are as important as its promise: insecure land tenure and expropriation risk, carbon revenues failing to reach local populations, and greenwashing by buyers (Vernet, 2025; Johnstone et al., 2025). These risks explain why Ghana, unusually among African states, has chosen to regulate voluntary market activity on its territory rather than leave it wholly to private standards, as the next section describes.

4. Ghana’s Participation and Arrangements

4.1. The regulatory pathway for any carbon transaction in Ghana

Ghana’s framework treats all carbon market activity on its territory, voluntary as well as Article 6, as subject to national oversight. The Environmental Protection Act, 2025 (Act 1124) supplies the statutory basis: it designates the EPA as the national carbon market authority, establishes the Ghana Carbon Registry and the Carbon Market Committee, creates the National Greenhouse Gas Mitigation Fund, and empowers the EPA to make detailed regulations (a Carbon Markets Regulations Bill is in finalisation).⁴ Operational detail currently sits in Ghana’s Framework on International Carbon Markets and Non-Market Approaches (2022), administered by the Carbon Market Office (CMO) within the EPA (Ghana Carbon Market Office, 2022; Batini, 2026). For a forest-based project, practice and the Framework together prescribe a sequenced pathway, summarised in Table 2.

Step	What it involves
1. Forestry Commission buy-in	Notify the FC (through its Climate Change Directorate / National REDD+ Secretariat). The FC participates as implementer or issues

⁴Environmental Protection Act, 2025 (Act 1124), ss 148–159. Section 150 establishes the Ghana Carbon Registry; ss 151–152 establish the Carbon Market Committee; ss 153–159 establish the National Greenhouse Gas Mitigation Fund; s 159 empowers the Environmental Protection Authority to make carbon market regulations.

Step	What it involves
	a letter of support / “no objection”. Projects must be framed as carbon projects from the outset — the FC has declined to allow plantation projects to be converted into carbon projects later (TaylorCrabbe, 2024).
2. Early EPA engagement	Discuss the project idea with the EPA’s Carbon Market Office; confirm alignment with national priorities and the eligible activity (“positive”) list; prepare a Project Concept Note.
3. Stakeholder consultation	Engage communities, traditional authorities, COCOBOD (in cocoa landscapes), civil society and local government to secure consent and agree benefit-sharing — see Briefing 1 on whose consent matters and why.
4. Mitigation Activity Design Document (MADD)	Prepare the full technical, financial and operational design, including the monitoring, reporting and verification (MRV) approach.
5. Independent validation	An accredited validation and verification body validates the MADD against the applicable standard.
6. Letter of Authorisation (LOA)	Apply to the EPA / Carbon Registry Office for an LOA covering the eligible mitigation activities. For Article 6 transfers, the LOA is what converts an emission reduction into an authorised, corresponding-adjusted ITMO.
7. Registration	The activity is registered in the Ghana Carbon Registry and assigned a unique Mitigation Activity Identification Number; subsequent issuances, transfers and retirements are tracked there to prevent double counting.
8. Monitoring, verification, transfer	Periodic monitoring reports are verified by the VVB; verified outcomes may then be issued, transferred or paid for under the relevant ERPA, standard or bilateral agreement, with corresponding adjustments applied where authorised.

Table 2. The transaction pathway for a forest-based carbon project in Ghana (Ghana Carbon Market Office, 2022; TaylorCrabbe, 2024).

Revenue governance is part of the same architecture: the National Greenhouse Gas Mitigation Fund provides a statutory vehicle for managing monies arising from carbon market

administration,⁵ while benefit-sharing within forest programmes follows the programme-level plans and the land and tree tenure rules examined in Briefing 1.⁶

4.2. Article 6 cooperation: Ghana as an early mover

Ghana was among the first countries in the world, and the first in Africa, to operationalise Article 6.2. Its bilateral cooperation began with Switzerland, with which Ghana signed an Article 6 framework agreement in November 2020, and has since expanded to further buyer countries including Sweden, Singapore and the Republic of Korea, alongside a pipeline of authorised mitigation activities spanning clean cooking, climate-smart agriculture and waste management (Ghana Carbon Market Office, 2025; Vernet, 2025). The significance for forest carbon is twofold. First, the institutional machinery, LOAs, registry, corresponding adjustment procedures, has been tested and is available to forest programmes. Second, Ghana's framework deliberately manages the NDC trade-off described in section 2.2: activities Ghana needs for its own unconditional NDC are not freely authorised for export, protecting the integrity of the national account while still attracting investment (Ghana Carbon Market Office, 2022).

4.3. Forest-sector transactions to date

Ghana's flagship forest carbon transaction is the Ghana Cocoa Forest REDD+ Programme (GCFRP), coordinated jointly by the Forestry Commission and COCOBOD across the High Forest Zone. Under an Emission Reductions Payment Agreement signed with the World Bank as trustee of the Forest Carbon Partnership Facility (FCPF) Carbon Fund,⁷ Ghana sells verified emission reductions at USD 5 per tonne, up to roughly USD 50 million. Two results-based payments have been received: USD 4,862,280 for 972,465 tCO₂e, followed by USD 16,895,805 for 3,379,161 tCO₂e, making Ghana one of the first African countries to be paid for verified jurisdictional REDD+ results (Appiah-Gyapong, 2026). Payments flow through a benefit-sharing plan and fund-flow mechanism to Hotspot Intervention Areas (HIAs), where community governance bodies, farmers, traditional authorities and landowners share

⁵Environmental Protection Act, 2025 (Act 1124), ss 153–159. The Fund's objects include financing climate change mitigation actions and supporting the administration of the carbon market framework.

⁶Constitution of the Republic of Ghana, 1992, art 267(6); see Briefing 1, Table 3 and accompanying text for the default attribution of carbon stakes and the stool land revenue formula.

⁷Emission Reductions Payment Agreement between the Republic of Ghana and the International Bank for Reconstruction and Development as trustee of the Carbon Fund of the Forest Carbon Partnership Facility, signed July 2019, covering up to ten million tonnes of CO₂e at USD 5 per tonne (approximately USD 50 million).

benefits in cash and in kind, with safeguards and a feedback and grievance redress mechanism in place (Forestry Commission, 2016; Appiah-Gyapong, 2026).

A second major transaction is the Ghana Shea Landscape Emission Reductions Project (GSLERP) in the northern savannah, developed by the Forestry Commission with UNDP and approved by the Green Climate Fund in 2020, USD 30.1 million in GCF grant funding with about USD 24.4 million in co-financing. GSLERP is a results-based programme rather than a credit sale: finance is disbursed against restoration of degraded shea parklands and savannah forest (including through CREMAs and Modified Taungya System plantations), with about 1.5 million tCO₂e of emission reductions achieved and significant community employment, particularly for women in the shea value chain (Appiah-Gyapong, 2026).

Looking forward, Ghana is preparing to monetise jurisdictional credits through the LEAF Coalition under the ART-TREES standard, alongside other private ERPAs, transactions that would move Ghanaian forest carbon into the premium, CORSIA-eligible segment of the market, and is scaling both compliance and voluntary market participation under the “Resilient Ghana” package (Appiah-Gyapong, 2026). At project level, voluntary-market forest projects (for example, cocoa agroforestry carbon projects financed by private buyers) continue to be developed under the Table 2 pathway, using contractual structures, CREMA-based contracts or, where CREMAs are unsuitable, aggregation vehicles such as companies limited by guarantee feeding a special purpose vehicle, to assemble and transfer the carbon rights of many smallholders (TaylorCrabbe, 2024).⁸

Programme / deal	Counterparty & instrument	Scale	Price / value	Status
Ghana Cocoa Forest REDD+ Programme (GCFRP)	World Bank FCPF Carbon Fund - ERPA (results-based payment)	Up to 10 MtCO ₂ e contracted; ≈294 MtCO ₂ e potential over 20 years	USD 5/t; ≈USD 50m ceiling	Two payments received (USD 4.86m + USD 16.90m for ≈4.35 MtCO ₂ e)

⁸The transfer of forest carbon credits in Ghana additionally requires Forestry Commission consent in practice: international registries have looked to the Forestry Commission for verification of credits generated from forest carbon projects, and stool land alienation rules (consent of principal elders, Lands Commission concurrence) apply to dealings with carbon interests in stool land (TaylorCrabbe, 2024). See Briefing 1, section 3.

Programme / deal	Counterparty & instrument	Scale	Price / value	Status
Ghana Shea Landscape ER Project (GSLERP)	Green Climate Fund via UNDP grant-funded results-based programme	6.1 MtCO ₂ e over 7 years; 25.2 MtCO ₂ e over 20 years (target)	USD 30.1m grant + USD 24.4m co-finance	Implementation; ≈1.5 MtCO ₂ e achieved; USD 17.6m disbursed
LEAF Coalition / ART-TREES	Corporate-sovereign coalition - jurisdictional credit purchase (ERPA)	Jurisdictional scale	Premium, CORSIA-eligible segment	Awaiting ART-TREES issuance
Article 6.2 bilateral agreements	Switzerland (2020), then Sweden, Singapore, Rep. of Korea - ITMO transfers	Project pipeline across sectors; forest activities eligible	Negotiated per activity	Operational; LOAs and first transfers under way
Voluntary project-level deals (e.g., cocoa agroforestry)	Private buyers / standards (Verra, Gold Standard) - credit sales	Project scale (e.g., ≈1–1.2 MtCO ₂ e over 18–20 years)	Market price	Pipeline; subject to Table 2 pathway

Table 3. Ghana’s principal forest carbon transactions and channels (Appiah-Gyapong, 2026; Ghana Carbon Market Office, 2025; TaylorCrabbe, 2024).

4.4 Transactional risks: double counting, nesting and bargaining power

Three risks dominate current practice. The first is double counting where project-level activities overlap geographically with the jurisdictional GCFRP: because the GCFRP accounts for emission reductions across whole landscapes, a private project planting trees in the same districts could claim tonnes the national programme also claims. There is, as yet, no robust legal structure for “nesting” projects within jurisdictional programmes, so deconfliction currently depends on Forestry Commission coordination, registry checks and contractual exclusivity clauses, for instance, express undertakings that participants in one project will not

enrol the same land in another emission reduction programme (TaylorCrabbe, 2024; Appiah-Gyapong, 2026).

The second risk is asymmetry of information and bargaining power. Communities and farmer groups depend heavily on government support to negotiate fair terms and lack technical and financial benchmarks, against international forecasts that Article 6-grade credits could trade at USD 36–45 per tonne by 2030, far above the USD 5 per tonne of the FCPF era (Appiah-Gyapong, 2026; MSCI, 2024). The third is regulatory transition: until the Carbon Markets Regulations are passed, parts of the framework (notably the 2022 Framework document) operate administratively rather than with full legislative force, leaving residual uncertainty for investors and communities alike (TaylorCrabbe, 2024; Batini, 2026).

5. Recommendations

To make forest carbon transactions in Ghana more credible, more bankable and fairer, this briefing recommends the following, complementing the ownership-side reforms in Briefing 1:

- a) **Pass the Carbon Markets Regulations promptly.** Codify the authorisation pathway (Table 2), eligibility lists, fees, timelines and appeal rights, giving the 2022 Framework full legislative force and reducing transaction risk for investors and communities.
- b) **Adopt express nesting rules.** Regulations or Forestry Commission guidelines should state how project-level activities are accounted for within jurisdictional programmes (baseline alignment, registry cross-checks, allocation of overlapping tonnes), replacing today's case-by-case deconfliction.
- c) **Standardise transaction documents.** Publish model ERPAs, Letters of Authorisation, community benefit-sharing agreements and cession agreements, with mandatory minimum terms on price disclosure, benefit shares, safeguards and grievance redress, so that smallholder-facing deals start from a protective template.
- d) **Equip communities to negotiate.** Establish an independent advisory facility (or expand the CMO's mandate) to give CREMAs, HIA governance bodies and farmer aggregations access to price benchmarks, legal advice and standard due diligence before signing.
- e) **Manage the NDC trade-off transparently.** Publish the criteria and analysis behind decisions to authorise corresponding adjustments for forest carbon exports, so that

Ghana does not sell mitigation it will later need for its own targets at prices below its marginal abatement cost.

- f) **Strengthen MRV and registry transparency.** Continue investing in the National Forest Monitoring System and make the Ghana Carbon Registry's record of issuances, transfers, retirements and benefit-sharing arrangements publicly searchable.
- g) **Target the premium market segments.** Prioritise ART-TREES/LEAF issuance and ICVCM Core Carbon Principles alignment so Ghanaian forest credits qualify for CORSIA and high-integrity corporate demand, rather than competing in the oversupplied low-price segment.

6. Conclusion

Ghana is no longer a bystander in carbon markets: it has been paid for verified forest emission reductions at jurisdictional scale, secured major climate finance for landscape restoration, and built one of Africa's most advanced Article 6 architectures. The transactional plumbing, Forestry Commission gatekeeping, EPA authorisation, the Ghana Carbon Registry and corresponding adjustment procedures, already functions. What remains is to consolidate it: binding regulations in place of administrative frameworks, clear nesting rules to protect against double counting, standardised and protective transaction documents, and deliberate positioning in the high-integrity market segments where forest carbon now earns a premium. If those steps are paired with the clarification of ownership and benefit-sharing recommended in Briefing 1, Ghana can convert its forests into a durable stream of climate finance that is credible to buyers, safe for its national climate accounts, and, critically, rewarding for the farmers and communities who keep the trees standing.

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