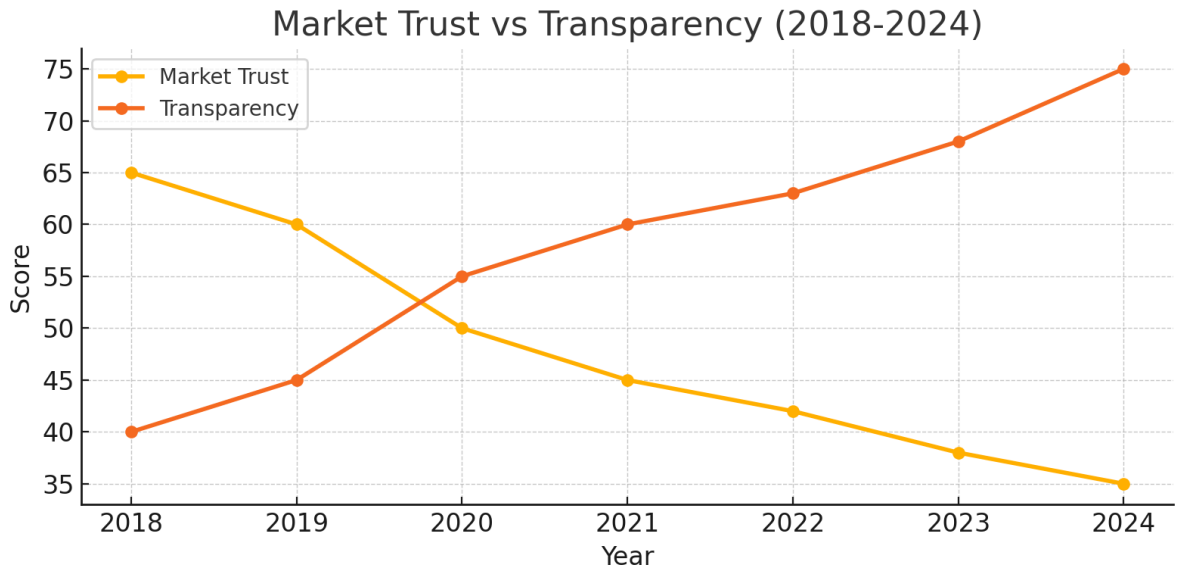
Risks and Difficulties in the Carbon Credit Marketplace

A White Paper by KarbonAssure.Tech



Executive summary

The carbon credit market has scaled rapidly; by 2024, market activity exceeded an estimated $950 billion. Growth has exposed structural issues: inconsistent verification, fragmented registries, double counting, and instances of weak additionality or permanence claims. These problems reduce market confidence, increase delivery risk for buyers, and elevate reputational and financial exposure for project developers. KarbonAssure.Tech offers a practical assurance framework that directly addresses verification latency, data integrity and trust through a combination of automated dMRV, algorithmic validation, and on-chain transparency. This document lays out the risks, trust issues and the technical approach KarbonAssure.Tech uses.

Contents

2. Key risks and trust gaps

Verification delays

Traditional MRV cycles often take 6–12 months, slowing credit issuance and creating timing risk.

Double counting & registry fragmentation

Credits or project identifiers can appear across multiple registries or reporting streams, producing accounting mismatches.

Weak additionality and permanence

A meaningful portion of voluntary credits have insufficient evidence of additional emissions reduction or weak safeguards for permanence (reversal risk).

Data quality and human bias

Manual sampling, report submission errors and inconsistent methodologies cause inaccurate baselines and over/under-estimation.

Greenwashing & reputational risk

Buyers and corporate stakeholders increasingly demand verifiable, auditable proof that claimed offsets are real and effective.

3. How KarbonAssure.Tech addresses these challenges

Automated dMRV

Continuous monitoring using satellites, IoT sensors and validated remote-sensing pipelines reduces human error and shortens verification latency (industry reduction estimate: ~80%).

Algorithmic validation

Advanced algorithms cross-validate diverse datasets, flag anomalies, and score project credibility prior to issuance.

Cross-registry reconciliation

Periodic automated syncs with major registries prevent double counting by reconciling identifiers and metadata.

Smart contracts & conditional minting

Credits are tokenised and released on-chain only after milestone confirmation, ensuring the credit lifecycle is auditable and immutable.

Transparency dashboards

Investor- and buyer-facing dashboards provide provenance, measurement logs, and lifecycle events for each credit.

Key figures

Global market activity (2024)

> $950 billion

Average MRV lead time (traditional)

6–12 months

Verification time reduction (KarbonAssure dMRV)

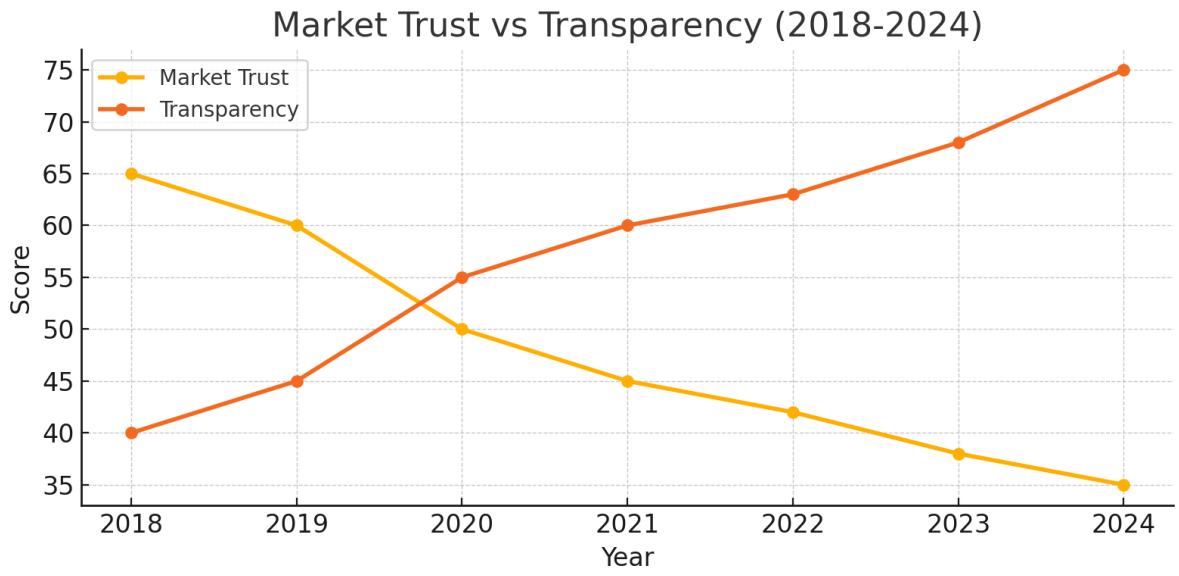
≈ 80%

Data integrity (post-integration)

Recorded lifecycle events on-chain

Transparency score improvement

+65% (integrated projects)


Market Trust vs Transparency (2018-2024)
Market Trust
Transparency
Score
Year
75
70
65
60
55
50
45
40
35
2018
2019
2020
2021
2022
2023
2024

4. Key figures

Global market activity (2024)	> $950 billion
Average MRV lead time (traditional)	6–12 months
Verification time reduction (KarbonAssure dMRV)	≈ 80%
Data integrity (post-integration)	Recorded lifecycle events on-chain
Transparency score improvement	+65% (integrated projects)

5. Roadmap

Short-term (0–12 months): Deploy AI anomaly detection to catch fraud and data drift. Expand registry connectors. Medium-term (12–24 months): Standardise a cross-registry protocol. Offer investor-grade ESG reporting modules. Long-term (24+ months): Establish KarbonAssure protocol as an industry reference for verified, on-chain carbon credits.

6. Appendix

Technical notes: Data sources include multispectral satellite imagery, ground IoT sensors and project telemetry. Algorithms include ensemble baseline models, time-series anomaly detection and geospatial change detection. Blockchain is used as a proof-of-ownership layer with smart contracts enforcing milestone-based minting and retirement.