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## MBK MRV & Blockchain Overview

*Verifiable Carbon Removal, Built on Trust and Technology*

At MBK International Services Inc., our carbon credit system is supported by a digitally native Monitoring, Reporting, and Verification (MRV) framework. By integrating IoT-based sensing, machine-logged operational data, and blockchain verification through IBM Hyperledger, MBK ensures that each credit issued is transparent, traceable, and audit-ready, even before the facility is operational.

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### 1. MRV Architecture Overview

MBK's MRV solution is completely integrated into our engineered biochar production process. Our system captures:

- **Batch-Level Production Data**  
Timestamped and GPS-tagged records for each biochar batch, including feedstock origin, processing conditions, and carbon yield.
  - **Operational Parameters via IoT Sensors**  
Real-time tracking of temperature, gas flow rate, residence time, and emissions from each pyrolysis module.
  - **Automated Ledger Logging**  
Key data points are cryptographically hashed and recorded in IBM Hyperledger, creating a tamper-proof digital audit trail.
  - **MRV API Compatibility**  
Our infrastructure integrates with third-party ESG platforms like SAP, Workiva, and Salesforce to streamline compliance reporting.
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### 2. Blockchain Infrastructure

We utilize IBM Hyperledger Fabric, a permissioned blockchain tailored for industrial-grade applications:

- **Immutable Entries:** All entries are permanent, digitally signed, and traceable to the facility and time of creation.
- **Validator Access:** Only certified verifiers (e.g., DNV, SCS Global Services) have node-level access under NDA.
- **Regulatory Audit Compliance:** Blockchain architecture aligns with ISO 14064, VM0044, and Puro.Earth data assurance protocols.
- **Buyer Integration Option:** Large-volume buyers may request private dashboard access to monitor FPA-aligned batches in real time.

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### 3. Data Governance & Access Control

To ensure buyer trust while protecting operational IP:

- **NDA-Governed Dashboards:** Access to batch-level MRV data, including audit logs and verification records, is granted only after executing the NDA.
- **Feedstock Chain-of-Custody:** Each biomass shipment is linked to FSC/PEFC certifications and recorded on-chain.
- **Environmental Outputs:** Verified metrics include CO<sub>2</sub>e removed, permanence classification, and co-benefit profiles (e.g., soil impact, SDG alignment).

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### 4. Verification & Audit Partners

Third-party verification is not optional, it is embedded in our delivery process:

- **Verifiers:** DNV and SCS Global Services (or other registry-approved auditors)
- **Audit Frequency:** Each carbon credit tranche undergoes quarterly verification for issuance and registry transfer
- **Registry Alignment:** Data is aligned to the requirements of:
  - Verra VM0044
  - Puro.Earth CORCs
  - Gold Standard Soil Enhancement
  - Climate Action Reserve (Biochar)

### 5. Why It Matters to Buyers

Feature	Buyer Benefit
Blockchain-backed batches	Zero-tamper, third-party verifiable credits
Live MRV dashboard	Tranche transparency + ESG integration
Registry-ready formatting	Instant acceptance by Verra, Puro, GS, CAR
IP-protected pre-NDA design	Protects proprietary tech during diligence
Field-to-credit traceability	Sustainable sourcing + emissions integrity

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## Summary

MBK's MRV + Blockchain system provides investor-grade assurance, ensures registry-grade compliance, and guarantees market-grade transparency, before, during, and after delivery.

To obtain a technical schematic, validator access, or FPA-linked dashboard preview, please contact us for NDA issuance.

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**Access by NDA only**