The Green Ledger

Synergies with Existing and Emerging XBRL Europe Initiatives

Enabling the formal audit trail for Sustainability Disclosures

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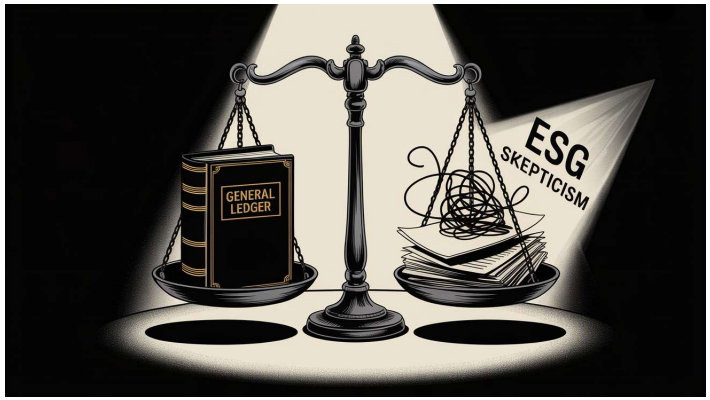

Why We Need a Green Ledger

Enabling the Seamless Audit Trail for Sustainability

- Rising stakeholder demand for credible ESG data amid regulatory pressure
- Greenwashing and sourcing risks eroding trust
  - 68% of executives admit to "sustainability-washing“, 41% say inadequate data hinders them according to IBM’s ESG 2023 data study
- No standardized audit trail for non-financial data, unlike financial accounting’s vouching/tracing
- Fragmented data sources (energy bills, supply chain logs) lack integration, validation, or reconciliation
- Critical gap: Stakeholders can’t trace ESG claims to granular source data

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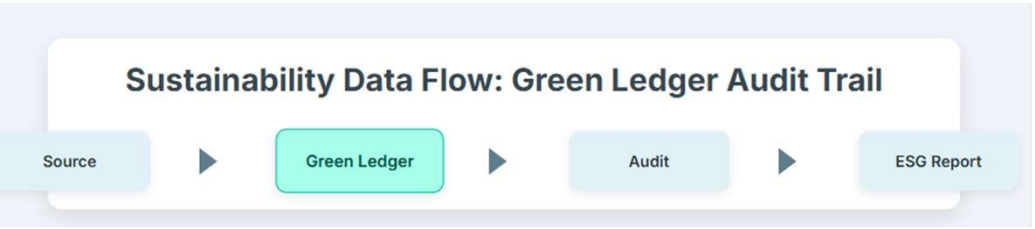

at A Green Ledger Would Do

Enabling the Seamless Audit Trail for Sustainability

- Serve as a centralized system to record, classify, and store raw ESG data (e.g., kWh consumed, supply chain emissions)
- Enable "vouching and tracing" for auditors: Verify existence (source → ledger) and completeness (ledger → source)
- Automate reconciliation between reported summaries (e.g., Scope 3 emissions) and underlying transactions
- Generate an immutable audit trail with timestamps, data lineage, and ownership
- Support real-time disclosure and scenario analysis (e.g., carbon footprint simulations)

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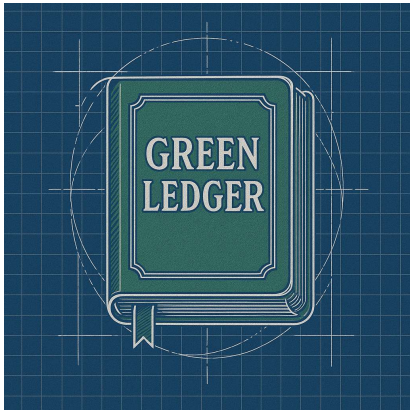

Specifying a Green Ledger

Enabling the Seamless Audit Trail for Sustainability

- Define scope: Cover all ESG dimensions (E: emissions/water, S: labor/data, G: policies) and materiality thresholds
- Standardize data taxonomy: Align with global frameworks (GRI, SASB, ISSB) and regulatory requirements
- Embed control frameworks: Automated validations, access controls, and error flags (e.g., anomalous emissions spikes)
- Require interoperability: APIs to connect IoT sensors, ERP systems, and third-party data (e.g., supplier ESG scores), MCP for GenAI access
- Ensure accessibility: Role-based dashboards for auditors, management, and stakeholders

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Building Blocks for a Green Ledger

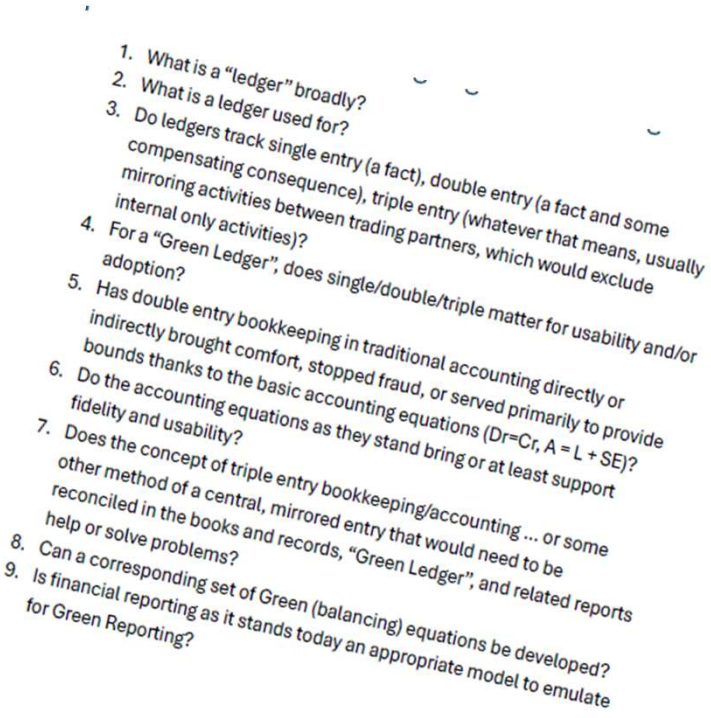
Enabling the Seamless Audit Trail for Sustainability

- **Data capture layer:** IoT, blockchain, and AI for automated ingestion (e.g., smart meters, supplier portals)
- **Storage infrastructure:** Secure cloud databases with blockchain for immutability.
- **ESG-specific controls:** Rule-based validation (e.g., emission factor libraries, unit conversions)
- **Integration middleware:** APIs linking financial ERPs and ESG platforms
- **Audit & analytics engine:** Tools for anomaly detection, trend analysis, and audit sampling
- **Human governance:** Cross-functional teams (sustainability, finance, IT) for oversight

Fifty Questions

Enabling the Seamless Audit Trail for Sustainability

- See Eric's paper with original questions and AI-enabled responses
- Accounting has its foundational accounting equations supporting entries
  - Dr = Cr
  - Assets = Liabilities + Equity
- Help refine the questions to establish the business requirements!



1. What is a "ledger" broadly?
2. What is a ledger used for?
3. Do ledgers track single entry (a fact), double entry (a fact and some compensating consequence), triple entry (whatever that means, usually mirroring activities between trading partners, which would exclude internal only activities)?
4. For a "Green Ledger", does single/double/triple matter for usability and/or adoption?
5. Has double entry bookkeeping in traditional accounting directly or indirectly brought comfort, stopped fraud, or served primarily to provide bounds thanks to the basic accounting equations (Dr=Cr, A = L + SE)?
6. Do the accounting equations as they stand bring or at least support fidelity and usability?
7. Does the concept of triple entry bookkeeping/accounting ... or some other method of a central, mirrored entry that would need to be reconciled in the books and records, "Green Ledger", and related reports help or solve problems?
8. Can a corresponding set of Green (balancing) equations be developed?
9. Is financial reporting as it stands today an appropriate model to emulate for Green Reporting?

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Synergies with Existing and Emerging Initiatives

Enabling the Seamless Audit Trail for ***Non-financial reporting***

- Associated with any L2BR (Ledger-to-Business Reporting) effort
- XBRL Reporting for Web 3.0 Working Group (W3 WG)
- SBR WG
- ESG WG

- XBRL GL CAMSS Assessment

Next Steps

Enabling the Seamless Audit Trail for ***integrated reporting***

- **Regulators:** Encourage Green Ledger adoption in ESG reporting rules
- **Software developers:** Help design and incorporate interoperable, auditable Green Ledger modules within ERP/ESG platforms
- **Audit oversight bodies (traditional and new):** Update audit standards to include ESG vouching/tracing (e.g., PCAOB, IAASB guidance) – equip for GHGEAP and SAPs
- **Framework orgs (GRI/ISSB):** Integrate Green Ledger specs into reporting standards
- **Corporations:** Pilot Green Ledger prototypes and share best practices
- **Urgency:** Start now—2025 reporting cycles demand auditable ESG data

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Questions?

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Thanks for your attention

The Green Ledger bridges the trust gap—making ESG as verifiable as financials

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