

System Proposal for Toray Composite Materials America, Inc.

Proposed solution is a cyber-physical Mass Balance Ledger that traverses the ISA-95 automation pyramid end-to-end.

Our proposed System automates traceability and reconciliation of sustainable inputs across ERP, MES, SCADA, and sensor layers to eliminate manual data stitching and ensures:

- Audit-ready,
- Tamperproof,
- Real-time,
- Continuous ISCC+
- GHG compliance.

By
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TORAY composite Materials America, Inc.

Specific Asks by ISCC+

ISCC+ Demands:

Chain of Custody:

Certified vs. non-certified material must be tracked across every transaction.

Mass Balance Method:

Certified inputs must reconcile with outputs + declared losses.

Audit-Ready Documentation:

Sustainability Declarations (SD) & Proof of Sustainability (POS) must be available for every certified batch.

Continuous Record-Keeping (APS v5.0):

Real-time, continuously updated logs — no backfilled reports.

Tamperproof Evidence:

Assurance that data cannot be retroactively altered.

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Current Solutions in the Market:

- Focus on bookkeeping & reporting.
- Automate SD/POS creation & packaging.
- Compliance = “consistent audit docs.”
Still rely on human stitching between ERP/MES/plant.

Proposed Solution:

- **Chain of Custody**
Tracks flows across ERP ↔ MES ↔ SCADA ↔ Sensors.
- **Mass Balance**
Cyber-physical ledger reconciles every kilogram in real time.
- **Audit Docs (SD/POS)**
Generated from the ledger, not curated manually.
- **Continuous Records: APS v5.0-ready**
Immutable, live, machine-verified data.
- **Tamperproof Evidence:**
Data contracts enforce schema & validation at each ISA-95 boundary.

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Key Solutions Comparison

Capability / ISCC+ Requirement	Circularise	Carboledger	Proposed Solution
ISCC PLUS templates, Audit pack – SD, POS	✓ Yes	✓ Yes	✓ Yes
Mass-balance Bookkeeping	✓ Yes	✓ Yes	✓ Yes (+ Cross-layer reconciliation)
Continuous records	● Reports/ZIP	● Real-time bookkeeping layer	✓ Ledger automatically updated through process flow
ISA-95 Data Traversal (L4→L1)	✗ No Claim	✗ No Claim	✓ Core Design
System-generated Evidence (Zero human stitching)	✗ Platform + Expert Support	✗ Tooling + Guidance	✓ Exceptions-only human review
Blockchain-backed Records	✓ optional	✗ Not needed	✗ Not needed / No use case
Immutable Data Contracts	✗ No Claim	✗ No Claim	✓ Yes

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Blockchain Vs Immutable Ledgers

Context

Blockchain is often promoted for supply chain traceability and sustainability certification.

Works best when:

- Multiple independent actors maintain nodes.
- Trust is distributed through consensus.
- Data is transparent across open ecosystems.

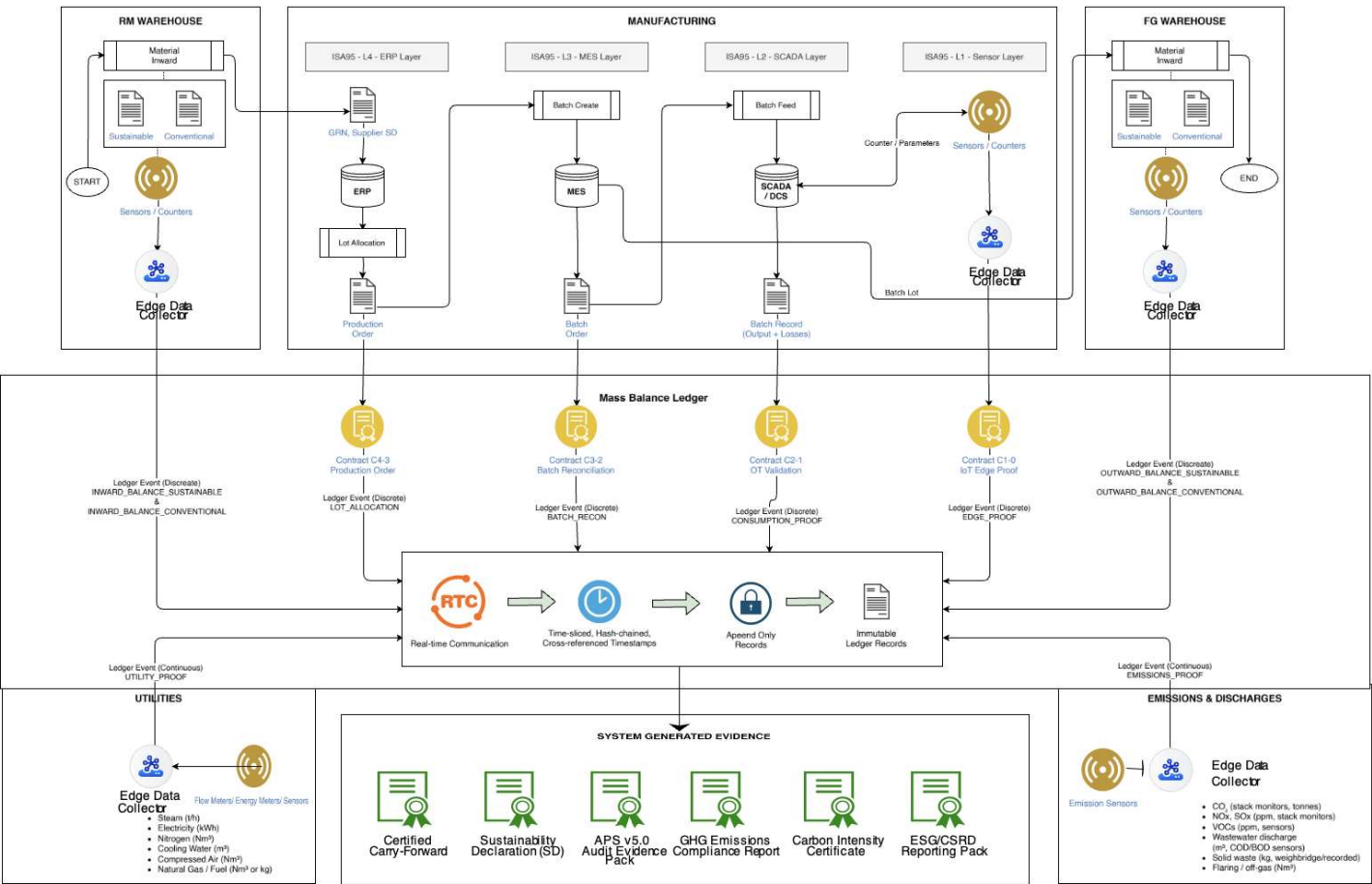
Why Not Here?

- ISCC+ certification and carbon fiber mass balance occur within a controlled industrial ecosystem, not a public one.
- Manufacturing plants don't want production data exposed on public or consortium chains.
- Blockchain adds overhead, latency, and complexity without solving the core compliance challenge.

Key Insight

- What ISCC+ needs is authentic correlation across ISA-95 layers, not a distributed consensus protocol.
- MATRIX-95 provides this with an immutable ledger, tamperproof yet efficient, within the enterprise's security perimeter.

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Work In progress...

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