SDG BLOCKCHAIN ACCELERATOR

Impact Measurement Framework – KarbonLedger

1. Project Information

- **Project Name:** Streamline — Powered by KarbonLedger
- **Challenge & UNDP Office:** CETP Compliance & Climate Credits – UNDP India (SDG Blockchain Accelerator, Cohort 1)
- **Document Version:** v1.0

2. SDG Alignment

SDG 6: Clean Water and Sanitation

- **Target:** Improve wastewater treatment and water quality in industrial clusters.
- **Indicator:** % of CETP effluent parameters (COD, BOD, TDS) meeting SPCB standards.

SDG 12: Responsible Consumption and Production

- **Target:** Enable transparent reporting of industrial compliance and sustainability outcomes.
- **Indicator:** Number of compliance reports auto-generated and verified on Streamline dashboard.

SDG 13: Climate Action

- **Target:** Quantify and reduce GHG emissions (e.g., methane) avoided through effective CETP operations.
- **Indicator:** Tons of CO_2e savings calculated and hashed on-chain with SDG metadata.

3. Key Performance Indicators (KPIs)

KPI	Measurement Method	Target / Threshold	Notes
On-chain compliance records created	Cardano transaction logs (Blockfrost)	≥ 90% success rate of testnet transactions	Verifiable by audit trail
Compliance reports auto-generated	Streamline dashboard backend	Reports generated during pilot	Each mapped to SPCB reporting format

Users onboarded (operators & regulators)	Dashboard auth logs	CETP operators + regulators in pilot	Proxy for adoption readiness
Carbon offsets calculated	AI module + off-chain validation	Tons CO_2e mapped to carbon assets	Proof-of-concept for future monetization
Stakeholder feedback sessions	Meeting notes / feedback tracker	Stakeholder specific sessions	Ensures user-centered design

4. Tracking Methods

- **On-Chain Metrics:**
  - Transactions hashed with SDG metadata (via Blockfrost).
  - Tokens minted/burned (COT/CET lifecycle) tracked with Supabase registry.
  - UTxO state changes monitored with Aiken contract outputs.
- **Off-Chain Metrics:**
  - Streamline dashboard activity logs (users, reports generated).
  - External audits of effluent sensor data for accuracy.
  - Feedback surveys with CETP operators and SPCB regulators.

5. Baseline vs Projected Outcomes (in next 12 months)

Metric	Baseline	Projected Outcome
On-chain compliance records	0	500+ records hashed with SDG metadata
Active users (operators/regulators)	0	15+ users onboarded
Compliance success rate	0	≥ 90% validated records
Carbon savings (CO_2e) quantified	0	≥ 1,000 tons/year

6. Monitoring & Reporting Plan

- **Frequency:** Real-time reporting to UNDP India & SPCBs.
- **Responsible Party:** KarbonLedger technical team + UNDP Accelerator PM.
- **Format:** Dashboard summary (JSON/CSV export), on-chain logs and PDF narrative report.
- **Tools:** Blockfrost API, Supabase dashboard, internal monitoring scripts, user feedback trackers.

7. Risks & Mitigation

- **Risk:** IoT sensor malfunction leading to unreliable data.
  - *Mitigation:* Redundant sensors + calibration protocols.
- **Risk:** Inconsistency between on-chain and off-chain records.
  - *Mitigation:* Weekly reconciliation scripts between Supabase logs and Cardano transactions.
- **Risk:** Low adoption by CETP operators due to usability concerns.
  - *Mitigation:* Early stakeholder feedback sessions and simplified UI iterations.