

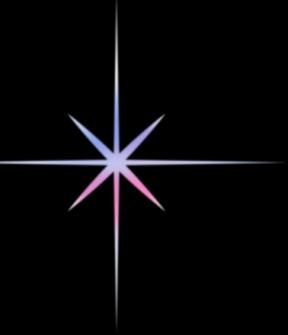
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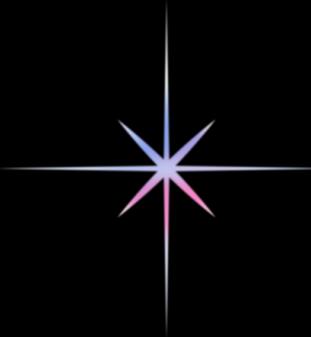


Problem Statement



Karnataka's industrial sector lacks a transparent, real-time system to measure, verify and trade carbon credits, a critical gap as India prepares to operationalise its Carbon Credit Trading Scheme (CCTS) in 2026. NABARD's pilot carbon credit project in Koppal—aimed at 3,500 mango farmers—suffered delayed payments and widespread farmer mistrust due to complex compliance procedures and poor communication. This highlights the urgent need for automated, transparent systems that eliminate manual verification bottlenecks and build stakeholder confidence.





IDEA TITLE

CarbonChain Karnataka -
AI-Driven Decentralized
Carbon-Credit Platform

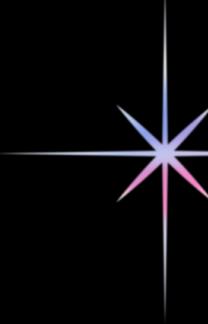




Summary

CarbonChain Karnataka fuses IoT emission sensors, AI analytics and a permissioned blockchain to build a tamper-proof carbon-credit ecosystem for Karnataka's industries. Real-time dashboards, predictive credit forecasting and peer-to-peer trading cut audit costs, ensure continuous compliance and accelerate decarbonisation, directly advancing SDG-13 (Climate Action) and SDG-9 (Industry Innovation)





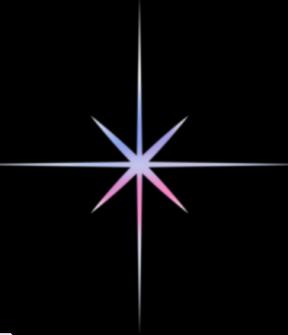
Detailed Solution Description

Industrial-grade IoT sensors capture stack-gas flow, CO₂, SO₂ and NO_x data every ten seconds, passing it to on-premise edge gateways for initial filtration and encryption. Cleansed streams are forwarded to our cloud AI layer, where LSTM models forecast 90-day emission trajectories and trigger optimisation routines that recommend process tweaks or automatic credit purchases.

A Hyperledger Fabric network records hashed sensor readings and executes smart-contract rules:

- Auto-mint carbon tokens when verified reductions exceed baselines.
- Instantly match buyers and sellers in a P2P marketplace, settling in under 30 s.

Detailed Solution Description

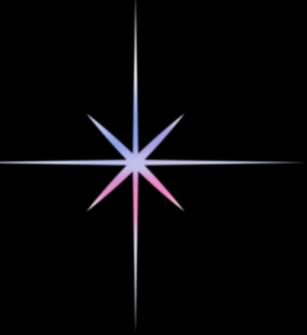


The architecture eliminates manual audits, slashes compliance effort by 60%, and provides an immutable trail for regulators. Modular micro-services and Kubernetes orchestration enable horizontal scaling to 1,000+ facilities. Integration APIs plug into existing ERP/SCADA systems, easing adoption.

By pairing precise measurement with predictive optimisation, CarbonChain reduces excess credit purchases, freeing capital for green CAPEX while visibly progressing India's CCTS goals. The same stack can be replicated in other states, positioning Karnataka as a national lighthouse for decarbonised industry.



Target Beneficiaries



- Large & medium industries (steel, cement, chemicals, IT campuses)
- State regulators & auditors (instant, tamper-proof reports)
- Carbon-offset project developers (direct market access)
- Local communities (improved air quality, climate resilience)



Innovation and Uniqueness

- Redictive compliance engine: 90-day credit demand forecasting.
- Automated verification: cryptographic linkage of sensor data to smart contracts.
- Dynamic pricing oracle: AI adjusts bid/ask spreads to market signals.
- Digital-twin sandbox: test process changes virtually before plant rollout.
- No existing Indian platform combines these four capabilities in a single, enterprise-ready stack.

THANK YOU!

