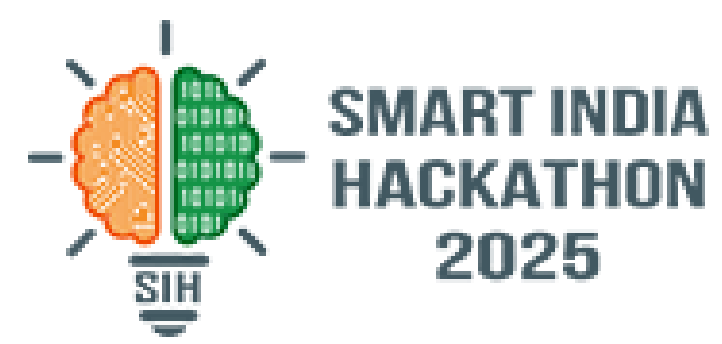


# SMART INDIA HACKATHON 2025



- **Problem Statement ID – 25038**
- **Problem Statement Title – Blockchain-Based Blue Carbon Registry and MRV System**
- **Theme- Clean And Green Technology**
- **PS Category- Software**
- **Team ID - 73**
- **Team Name - GreenETH**



## IDEA TITLE

### The Problem

- 1) The current carbon market is plagued by **opacity, fraud, and double-counting**, leading to widespread distrust and "greenwashing" accusations.
- 2) Traditional **MRV (Measurement, Reporting, and Verification)** is a slow, manual, and cost-prohibitive process that fails to provide auditable proof of climate impact.
- 3) This broken system hinders vital **climate finance** from reaching high-integrity projects, stalling global net-zero goals.

### Our Solution

### Innovation and Uniqueness

#### Hybrid Governance Model

- Bridges the trust of decentralized tech with **NCCR** (Government) compliance and validation.

#### On-Chain Retirement & Traceability

- Tokens enable instant, auditable retirement, guaranteeing **Zero Double-Counting** and creating a public, full-lifecycle trace for every asset. (Focuses on the key benefit).

#### Decentralized MRV Vault

- Utilizes **IPFS and cryptographic hashing** to create a tamper-proof "data vault" for project proofs, resolving the core integrity issues in reporting. (Focuses on technical novelty).

#### Decentralized Data Proof

Secure evidence via IPFS hashing

#### Automated Oversight

Smart contracts manage approval workflow (Verifier → NCCR).

#### Time-to-Market Reduction

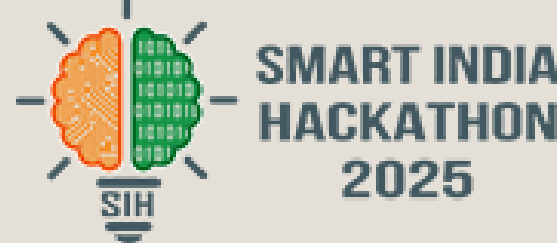
Eliminates paperwork, speeds up approval

#### Streamlined Project Approval

Fast, automated, and secure

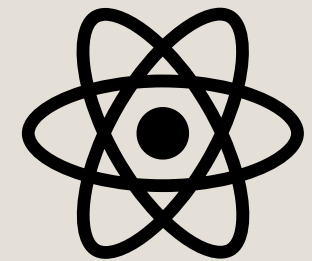
Green ETH

# TECHNICAL APPROACH



## Tech Stack

- Frontend:

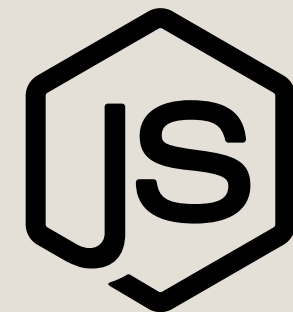


React.js



TailwindCSS

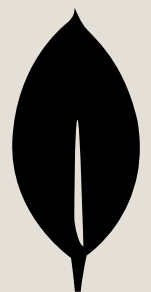
- Backend:



Node.js



Express.js



MongoDB

- Blockchain:

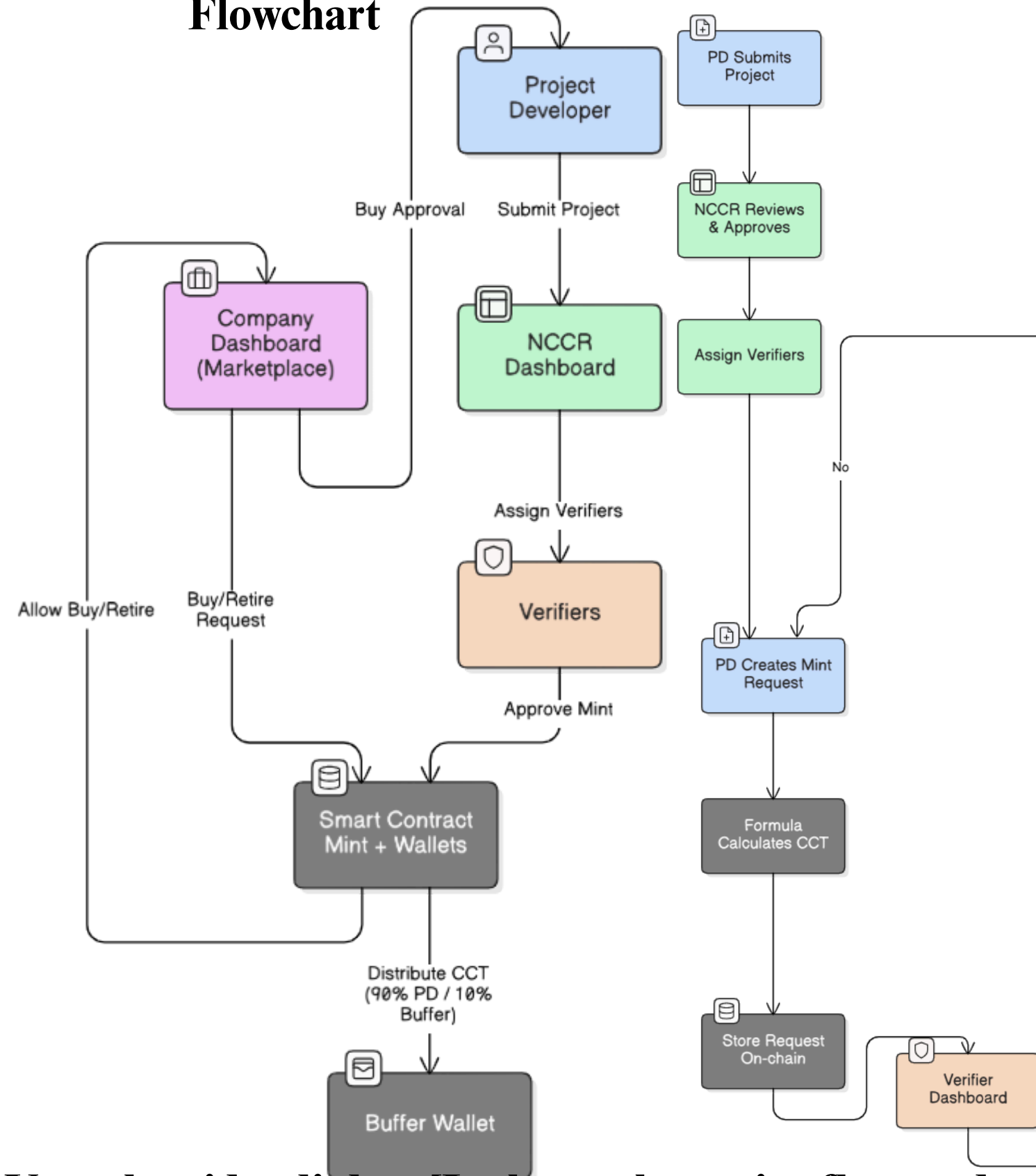


OpenZeppelin

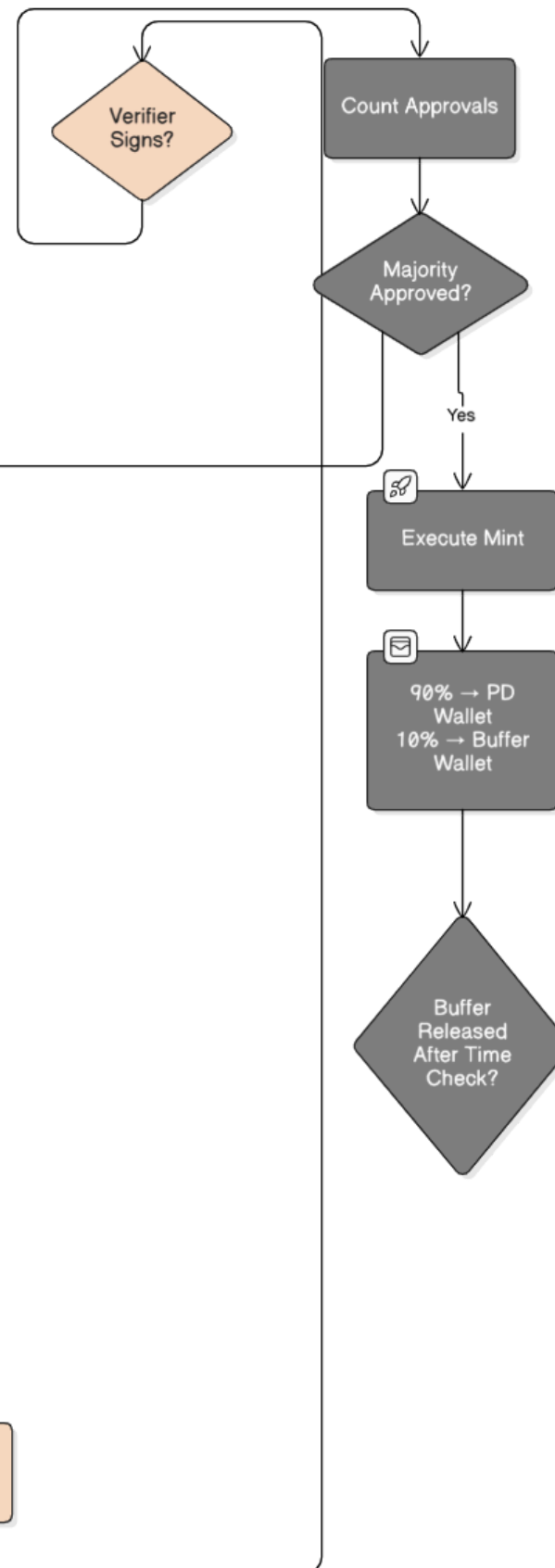


Solidity

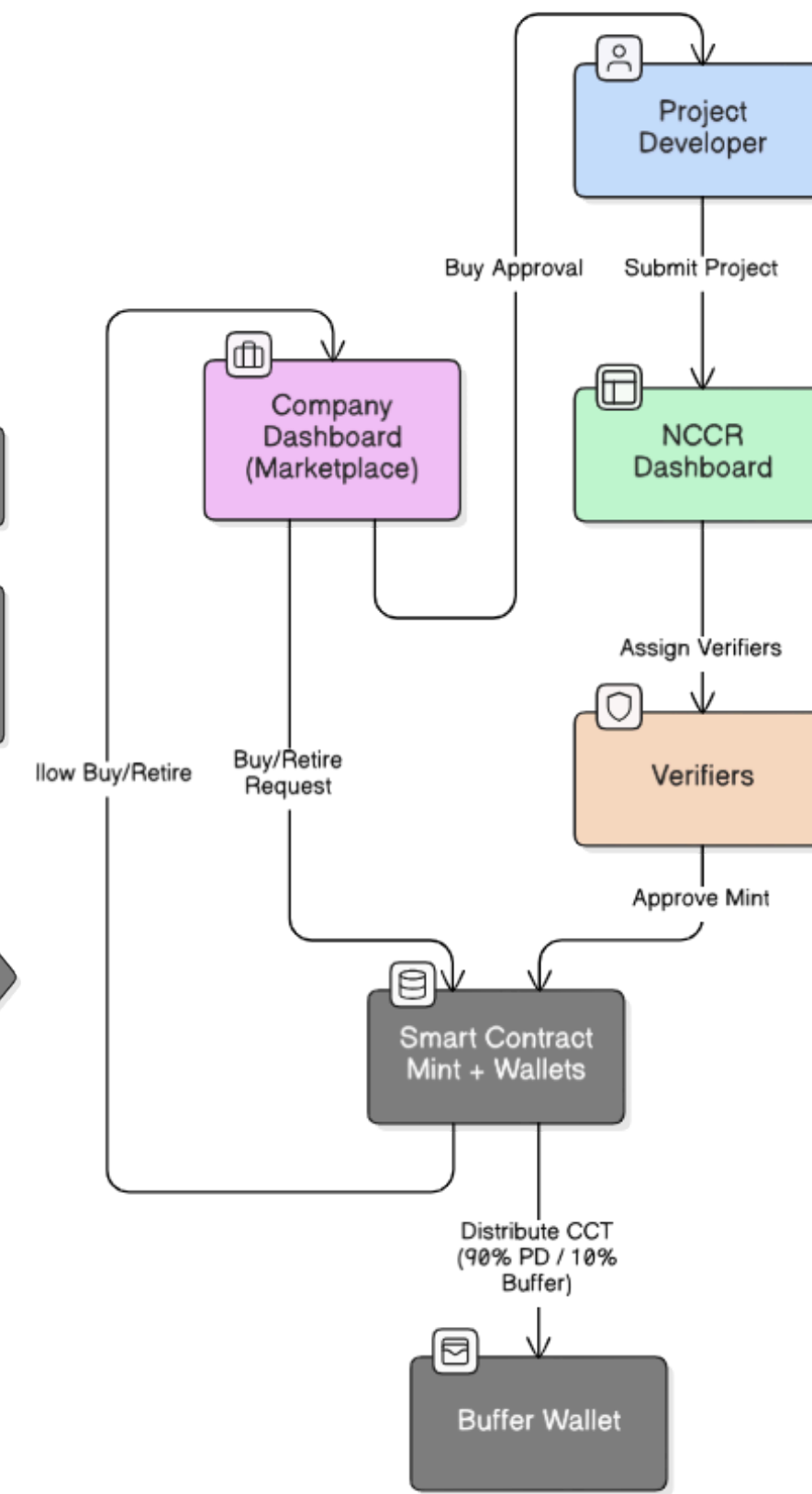
## High-Level Overview Flowchart



## Minting Flow



## 3 Marketplace Flow



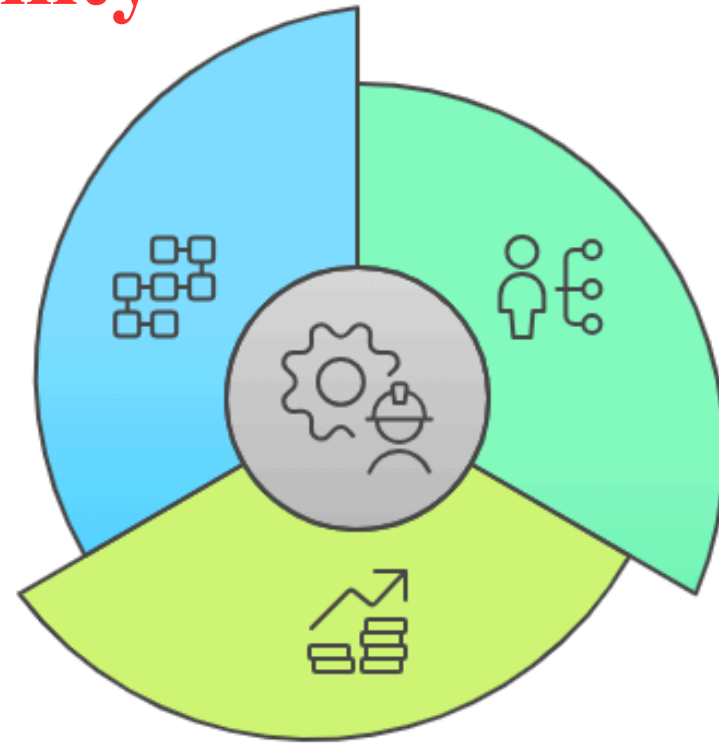
Youtube video link -: [It shows the entire flow and process of our application/prototype.]

<https://www.youtube.com/watch?v=AEiGvYPUi84>

# FEASIBILITY & VIABILITY

## Technical Feasibility

- ERC-20 + IPFS:  
Secure & decentralized
- MetaMask + Hybrid: Scalable & user-controlled



## Operational Feasibility

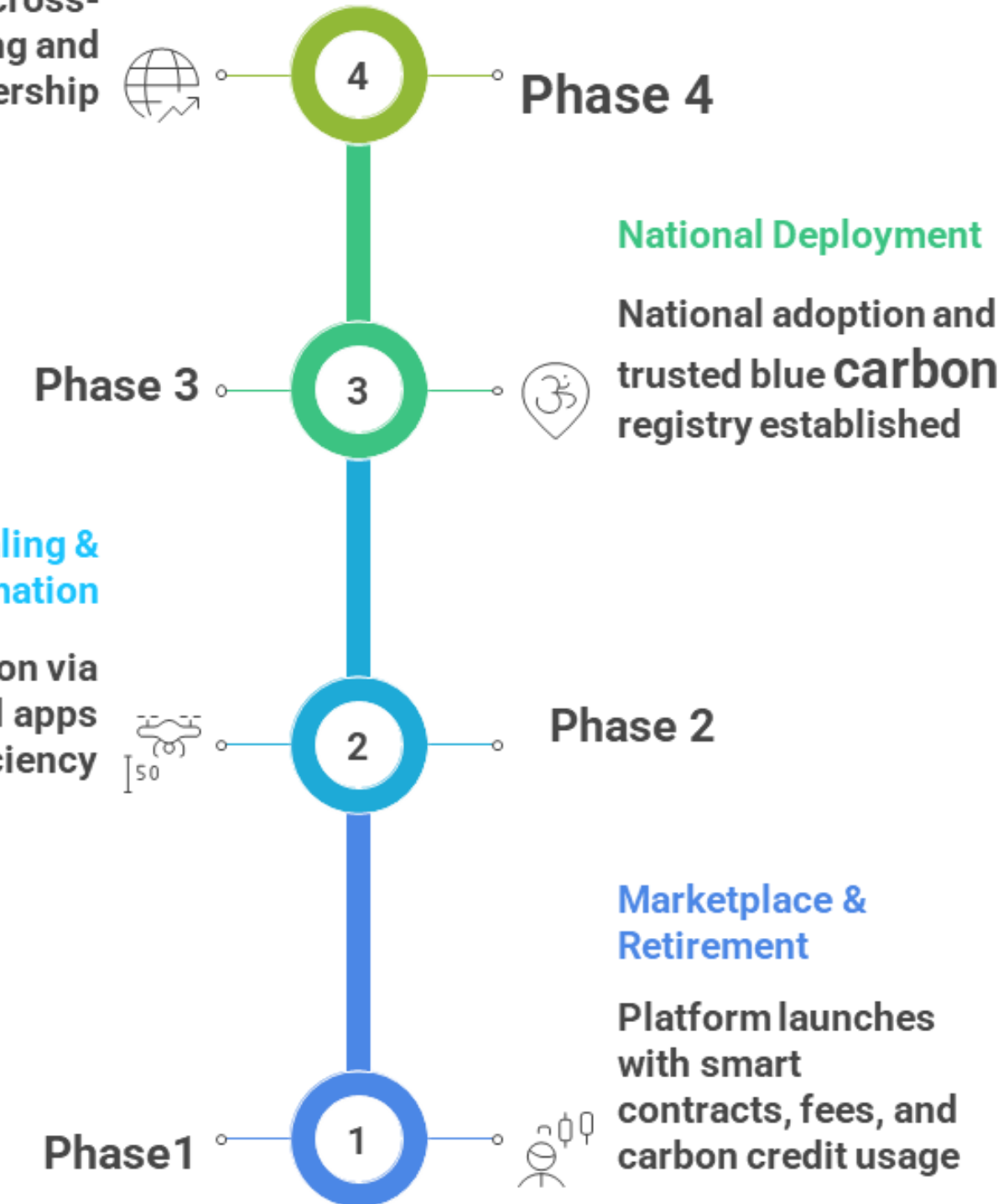
- Clear roles: Developers, Verifiers, NCCR.
- Hybrid model: Oversight + Transparency

## Financial Feasibility

- Low cost: One-time build, minimal ops
- Revenue: Small fee, high demand

### International Expansion

Global integration enables cross-border trading and leadership





ENVIRONMENT

Supports scaling up the conservation and restoration of mangroves, seagrasses, and salt marshes.

SOCIAL

Empowers indigenous and coastal communities with ownership and control over ecosystem services.

ECONOMIC

Unlocks new revenue streams through high-integrity carbon credits.  
Attracts impact investment and green finance into the blue economy.

IMPACTS

BENEFITS

GLOBAL STANDARDIZATION

Ensures transparent, secure, and globally standardised monitoring, reporting, and verification of marine and coastal carbon assets

TRANSPARENCY AND TRUST

Blockchain provides a public, tamper proof ledger which ensures authenticity and transparency of each transaction.

IMPROVED MRV EFFICIENCY

Automates data collection, verification, and reporting using smart contracts.

ENHANCED ACCOUNTABILITY

Smart contracts enforce compliance with carbon standards (e.g., Verra, Gold Standard).

- Saraji, S. & Borowczak, M. (2021). A Blockchain-based Carbon Credit Ecosystem. arXiv preprint arXiv:2107.00185.  
Available at: <https://arxiv.org/abs/2107.00185>
- Zhao, C., Sun, J., Gong, Y., Li, Z. & Zhou, P. (2022). Research on the Blue Carbon Trading Market System under Blockchain Technology. Energies, 15(9): 3134. DOI:10.3390/en15093134. Available at: <https://www.mdpi.com/1996-1073/15/9/3134>