DeFi Project: AI-Driven ESG-Compliant Tokenized Asset Platform

Overview:

Since building a full-scale DeFi platform with AI, blockchain and compliance features isn't feasible for us at the moment, we will instead simulate it. I will divide the roles across each of our domains with specific roles and duties that will be explicitly mentioned later. **The blockchain team** will handle tokenization by creating a mock ESG token using applications specific for this purpose, delivering a basic smart contract and a simulated trading interface. **The AI/ML teams** primary focus would be on predictive analytics, using python *(you can use my VSC paid version for ease)* and free data sets to build a simple greenwashing detection model, presenting their findings in a specific format. **For big data analytics**, another team will process publicly available ESG datasets using excel or Power BI to generate visualizations of market trends and token performance. **The compliance group** will be asked to stimulate regulatory requirements and possible implications by creating a mock system on platforms that are designed to express this. **Lastly, the ESG team** will track environmental impacts by building a carbon footprint dashboard in Google Sheets. We will then combine our deliverables (code snippets, datasets analyses, interface mockups…) preferably into a cohesive video or a presentation demonstrating how our domains interact in a system. Each team will be focusing on their specialized domain, contributing and considering an integrated vision. The final output will allow us to showcase our technical understanding and practical application across these domains. Of course, there will be some discrepancy in workload in this and any other future projects we engineer. But this will hopefully be within our academic scope and we will hopefully gain equitable expertise through more practicals.

Note: This is a draft and not final. Expect to see errors and feel free to correct and suggest amendments as we advance. I only have expertise in my domain.

PROJECT TITLE:

“GreenChain”- AI-Powered DeFi platform for tokenized ESG-compliant assets.

PHASE 1: Initiation

Team formation: Divide into 5 specialized teams *(help can be assigned if wished)*
Milestone planning: Create a timeline with weekly sync meetings
Toolkit Set-up: Establish GitHub repo or Notion workspace for clarity

Phase 2: Development

Week 1: Foundation & Setup

Goal: Establish core components and team workflows.

Blockchain Team:
-Learn Solidity basics using Remix IDE (free).
-Deploy a simple ERC-20 token on Polygon Mumbai (free testnet).
Purpose: Create the base token for ESG assets.

AI/ML Team:
-Explore free ESG datasets (e.g., Kaggle, Yahoo Finance).
-Set up Google Colab for Python-based analysis.
Purpose: Prepare data for model training.

Big Data Team:
-Download sample ESG datasets (e.g., carbon emissions by industry).
-Experiment with Tableau Public (free) for basic charts.
Purpose: Understand data trends for visualization.

Compliance Team:
-Research key DeFi regulations (e.g., MiCA, KYC).
-Draft a mock KYC process using Google Forms (free).
-Research possible implications
Purpose: to plan an identity verification flow.

ESG Team:
-Study ESG reporting standards (e.g., GRI).
-Create a Google Sheet for tracking mock carbon data.
Purpose: Design the sustainability tracking system.

Deliverables:

-Token contract deployed on testnet.
-ESG dataset loaded into Colab.
-Basic Tableau dashboard started.
-KYC form draft.
-ESG tracking template.

Week 2: Core Development

Goal: Build functional prototypes for each component.

Blockchain Team:
-Enhance the token with ESG features (e.g., lockCarbonCredits).
-Simulate trading on a forked Uniswap interface (free).
Purpose: Show how tokenized assets trade.

AI/ML Team:
-Train a simple ESG scoring model (Scikit-learn).
-Test NLP on sustainability reports (Hugging Face, free).
Purpose: Detects greenwashing risks.

Big Data Team:
-Refine Tableau dashboards with live data connections.
-Purpose: Visualize ESG performance trends.
-Compliance Team:
-Build a Flask app (Python, free) for mock KYC checks.
Purpose: Simulate user verification.

ESG Team:
-Link Google Sheets to mock APIs for "live" carbon tracking.
Purpose: Demonstrate real-time ESG monitoring.

Deliverables:

-Upgraded token contract.
-Basic AI model for ESG scoring.
-Interactive Tableau dashboard.
-KYC demo (Flask).
-Automated ESG tracker.

Week 3: Integration & Testing

Goal: Connect components and validate workflows.

All Teams should now:

Combine outputs:

-Link token events to Tableau (via Google Sheets).
-Connect AI scores to compliance checks.

Test end-to-end flow:
-User gets KYC-approved (Flask).
-Trades ESG tokens (Uniswap mock).
-Views impact on dashboard (Tableau).
Purpose: Ensure seamless interaction between systems.

Refine their models:
-Improve model accuracy (AI team).
-Polish dashboards (Big Data team).
-Add governance features (e.g., Snapshot.org for voting).

Deliverables:
-Integrated demo (video or slides).
-Test results (e.g., model accuracy, contract bugs).

Week 4: Finalization & Presentation

Goal: Prepare deliverables and showcase the project.

Documentation:
-Write a user guide (GitHub README).
-Record a 5-minute demo video (Loom, free).

Video or presentation:
-Explain how each tool solves ESG finance challenges:
-Remix + Polygon: Transparent asset tokenization.
-Scikit-learn + Hugging Face: AI-driven risk analysis.

Tableau: Data-driven decision-making.

Flask + Snapshot: Regulatory compliance.

Deliverables:
-Final slide deck.
-Demo video.
-Public GitHub repo (code + docs).
-Publish on LinkedIn or on our own newsletter.

Toolkit Summary (All Free)

Component	Tools	Purpose
Blockchain	Remix, Polygon, OpenZeppelin	Tokenize ESG assets securely
AI/ML	Scikit-learn, Hugging Face	Detect risks and greenwashing
Big Data	Tableau Public, Kaggle	Visualize ESG trends
Compliance	Flask, Snapshot.org	Simulate KYC and governance
ESG Tracking	Google Sheets, Apps Script	Monitor sustainability metrics