

Project Idea

< Blockchain-Based Carbon Credit Trading System >

Why is this important for New Zealand?

- New Zealand aims for **carbon neutrality by 2050**, requiring an efficient and transparent emission reduction mechanism.
 - The current **Emissions Trading Scheme (ETS)** lacks **trust, transparency, and accessibility**, making it prone to manipulation.
 - **High emissions from agriculture and transport** sectors require an effective system to monitor and trade carbon credits efficiently.
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How Blockchain Can Solve This Problem

1. Recording Carbon Emissions & Credits on the Blockchain

- Each company's carbon emissions are **automatically recorded using smart contracts**, making data tamper-proof.
- **Carbon credits are tokenized as NFTs or fungible tokens**, ensuring **transparency and traceability** in transactions.

2. Building an Automated Carbon Credit Marketplace

- A **blockchain-based P2P (peer-to-peer) trading platform** allows companies to **trade carbon credits directly without intermediaries**.
- **Smart contracts automatically verify compliance** before approving transactions, reducing administrative overhead.

3. Real-Time Carbon Emission Monitoring with IoT & Blockchain

- **IoT sensors track real-time emissions from factories, farms, and transportation**, ensuring accurate reporting.
 - These data points are securely stored on the **blockchain ledger**, making carbon reduction efforts **verifiable and auditable**.
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Advantages of Using Web3 for Carbon Credit Trading System

1. Prevents Data Manipulation (Immutable Ledger)

- Blockchain records cannot be altered, preventing companies from falsifying emissions data.

2. Transparent Carbon Credit Trading

- Peer-to-peer (P2P) trading without intermediaries, reducing costs and increasing efficiency.
 - 3. Automated Smart Contract Execution**
 - Carbon emissions are measured, and credits are allocated and traded automatically through smart contracts.
 - 4. Real-Time Emissions Monitoring**
 - IoT sensors feed real-time data into the blockchain, ensuring continuous tracking.
 - 5. Cost Reduction**
 - Cuts out middlemen in carbon trading, minimizing administrative overhead and transaction fees.
 - 6. Realistic :able to appeal to Benefits for the Government**
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Disadvantages of Using Web3 for Carbon Credit Trading System

- 1. IoT Sensor Accuracy Issues**
 - If sensors malfunction, incorrect emissions data may be recorded on-chain.
 - If IoT sensors malfunction or are hacked, incorrect carbon emissions data may be stored on the blockchain.
 - Even with Web3, inaccurate sensor data can compromise the system
 - 2. Smart Contract Vulnerabilities**
 - Poorly coded smart contracts can lead to unexpected errors or hacks.
 - 3. Scalability Challenges**
 - Storing large amounts of data directly on the blockchain can slow down the network. Networks like Ethereum struggle with transaction speed and costs when handling large datasets.
 - Solution: Use Layer 2 solutions like Polygon, Arbitrum, or private blockchains.
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Why Web3 Solves This Problem

- In traditional carbon management, companies manually report emissions, which can be manipulated. Web3 ensures trust by making all emissions data immutable and verifiable.

Challenges in Traditional Carbon Emissions Management

How Web3 Solves It

Companies can manipulate data	→ Blockchain records emissions data in real time—no alterations possible.
Inefficient carbon credit trading (high fees, delays)	→ P2P smart contract-based trading eliminates intermediaries and automates transactions.
Government-controlled data storage can be biased or manipulated	→ Decentralized ledger ensures transparency and prevents data tampering.
Difficult to verify if companies actually reduce emissions	→ IoT sensors + blockchain ensure real-time monitoring and automatic verification.

Conclusion: The Most Impactful Blockchain Solution for New Zealand

- Encourages **carbon reduction**
- **Reduces costs** and **improves efficiency**
- **Enhances transparency and trust** in the system

Rapid Development Plan

Roles
