

**Project Stage - II (414456)**

*report on*

BLOCKCHAIN-BASED CARBON CREDIT ECOSYSTEM

*submitted to*

Savitribai Phule Pune University

*in partial fulfillment of the requirements for the award of*

Bachelor of Engineering in Information Technology

*by*

**Amol Netke (B400080856)**

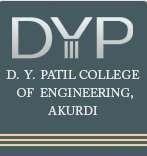
**Yogesh Zade (B400080916) Harsh Satwani (B400080816) Yuvrajsing Solanke (B400080900)**

*under the guidance of*

**Mrs. Parvati Bhadre**

Department of Information Technology DY Patil College Of Engineering, Akurdi

**2024 - 2025**



# CERTIFICATE

This is to certify that the following students have satisfactorily carried out the

B.E. project work entitled ‘**Blockchain-based Carbon Credit Ecosystem’**. This work is being submitted for the award of Bachelor’s Degree in Information Technology. It is submitted in the partial fulfillment of the prescribed syllabus of Savitribai Phule Pune University, Pune for the academic year 2024 – 2025. This project report has not been earlier submitted to any other Institute or University for the award of any degree or diploma.

**Amol Netke (B400080856)**

**Yogesh Zade (B400080916) Harsh Satwani (B400080816) Yuvrajsing Solanke (B400080900)**

Mrs. Parvati Bhadre Dr. Latika Desai (Guide) (Academic Administrator)

(External Sign) Date :

# ACKNOWLEDGEMENT

With immense pleasure, we present the Project report as part of the curriculum of the **B.E. Information Technology Engineering**. We wish to thank all the people who gave us an unending support right from when the idea was conceived. We express sincere and profound thanks to our project guide **Mrs. Parvati Bhadre** and **Dr. Latika Desai, Academic Administrator** who is ready to help with the most diverse problems that we have encountered along the way. We express sincere thanks to all staff and colleagues who have helped directly or indirectly in completing this seminar successful.

**Name Signature**

Amol Netke – B400080856 Yogesh Zade – B400080916 Harsh Satwani – B400080816 Yuvrajsing Solanke – B400080900

# ABSTRACT

Climate change and global warming are critical issues of our time. One way to address these challenges is by reducing greenhouse gas emissions through a global carbon trading system. A carbon credit is a permit that allows the holder to emit a specific amount of carbon dioxide or other greenhouse gases, with one credit typically representing one ton of carbon dioxide. These credits can be bought, sold, or traded, creating a financial incentive for companies to reduce their emissions. However, current carbon credit systems face problems like fragmentation, lack of transparency, and high transaction costs that benefit intermediaries rather than the environment. Our project proposes a blockchain- based Carbon Credit Ecosystem to solve these issues. By using smart contracts and blockchain technology, we aim to make carbon markets more transparent, accessible, and efficient. The ecosystem will include a tokenization mechanism for securely digitizing carbon credits, clear protocols for creating and retiring these credits, and a transparent system for their distribution and trading. Additionally, we will engage all relevant stakeholders, such as the energy industry, project verifiers, liquidity providers, NGOs, citizens, and governments, ensuring that the system benefits everyone involved. This model could also be applied to other credit and trading systems.

***Keywords: Blockchain, Carbon Credits, Smart Contracts, Tokenization, Emissions Trading, Decentralization, Climate Change, Transparency, Sustainability, Green Energy.***

**TABLE OF CONTENTS**

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Name** | **Page No.** |
| **1** | **Chapter 1 Introduction** | **1-2** |
| 1.1 | Overview | 1 |
| 1.2 | Motivation | 2 |
| 1.3 | Objectives | 2 |
| **2** | **Chapter 2 Literature Survey** | **3-4** |
| **3** | **Chapter 3 System Design** | **5-9** |
| 3.1 | Problem Statement | 5 |
| 3.2 | Overview of the Proposed System | 5 |
| 3.3 | System Architecture | 5-6 |
| 3.4 | Process Flow | 7-9 |
| **4** | **Chapter 4 System Requirements** | **10-12** |
| 4.1 | Functional Requirements | 10 |
| 4.2 | Non-Functional Requirements | 11 |
| 4.3 | Hardware Requirements | 11 |
| 4.4 | Software Requirements | 12 |
| 4.5 | Network Requirements | 12 |
| **5** | **Chapter 5 System Implementation** | **13-16** |
| 5.1 | Technologies Used | 13-14 |
| 5.2 | Smart Contracts | 14-15 |
| 5.3 | Frontend-Backend Integration | 15-16 |

|  |  |  |
| --- | --- | --- |
| 5.4 | Database Setup & Management | 16 |
| 5.5 | Challenges Faced during Development | 16 |
| **6** | **Chapter 6 Results & Discussion** | **17-21** |
| **7** | **System Testing** | **22-24** |
| **8** | **Advantages & Limitations** | **25-27** |
| 8.1 | Advantages | 25-26 |
| 8.2 | Limitations | 27 |
| **9** | **Chapter 9 Future Scope** | **28-30** |
| **10** | **Conclusion** | **31** |
| **11** | **References** | **32** |
| **12** | **IJRASET published research paper** | **33-38** |
| **13** | **ICCSS Certification** | **39** |
| **14** | **Plagiarism Report** | **40** |

**LIST OF DIAGRAMS & TABLES**

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Name** | **Page No.** |
| **2.1** | **Related Work** | **3-4** |
| **3.3.1** | **Three-tier architecture** | **5** |
| **3.4.1** | **Flowchart** | **7** |
| **6.1** | **Test Cases** | **22-24** |