

# AI-Powered Carbon Footprint Calculator

*Abhimanyu Bhadauria, Saptarshi Banerjee, Aditi Agrawal, Nithin Alfred, Jibei Ma*

## Introduction

This report outlines the development and implementation of an AI-powered carbon footprint calculator designed to assist companies and individuals in calculating and reducing their carbon footprint. The tool leverages predictive analytics to optimize energy use and resource allocation while providing an interactive, user-friendly interface for guidance and reporting.

## Why Our Product Matters

According to the Paris Agreement, limiting global temperature rise necessitates reducing average individual CO<sub>2</sub> emissions to less than 2 tonnes by 2050, requiring a more than 50% reduction from current levels. Currently, the average global carbon footprint per person stands at approximately 4.7 tonnes annually. Our product addresses critical global challenges, including reducing carbon emissions to mitigate environmental impact. It supports businesses in meeting regulatory requirements and fosters sustainability efforts through standardized carbon footprint calculations. By promoting a uniform approach, it contributes to achieving global climate targets.

## Market Needs

There is a growing demand for accessible, real-time carbon footprint calculations that can be standardized across enterprises. Individuals seek awareness and incentives for sustainable daily practices, while businesses require user-friendly tools for compliance and CSR initiatives.

## Challenges

Key challenges include navigating complex regulatory requirements for carbon emissions, managing upfront and ongoing operational costs associated with sustainability initiatives, meeting increasing consumer expectations for transparent environmental practices, and effectively integrating robust corporate social responsibility (CSR) strategies.

## Our Solution

Our solution offers a standardized tool for calculating carbon footprints at an enterprise level, complemented by a gamified app to enhance user engagement. It provides real-time monitoring and optimization suggestions based on predictive analytics, supporting comprehensive management of carbon emissions through a user-friendly interface.

## Unique Value Proposition

Our tool distinguishes itself with real-time capabilities, comprehensive carbon footprint management features, and a user-friendly interface powered by a conversational AI chatbot. Unlike static calculators, it

continuously monitors emissions, provides actionable insights, and simplifies data handling. This approach empowers users to proactively manage and reduce their environmental impact while enhancing compliance and operational efficiency.

## Technology and Development

Our carbon footprint calculator employs advanced technology, including AI-driven predictive algorithms such as the XGBoost machine learning model. This model integrates variables such as diet, transportation habits, energy sources, waste management practices, and technology usage. The model's accuracy, with a mean absolute percentage error of 7% in testing, allows it to provide precise predictions of carbon emissions. Our development process focuses on robust data integration, scalability, and user interface optimization through a conversational AI chatbot. This ensures accurate, real-time insights and a seamless user experience, catering to both individual users and enterprise clients effectively.

## Market Strategy

Our strategy focuses on targeting manufacturing companies, tech firms, and SMEs through online platforms, trade shows, and direct sales. Online platforms provide broad accessibility, while trade shows offer direct networking opportunities and showcase our innovative solutions to industry leaders. Direct sales ensure personalized engagement with businesses seeking effective carbon footprint management. We aim to scale our operations to capture a significant market share in Paris, projected to reach €135 million by 2025, underscoring our commitment to advancing sustainability through technology-driven solutions.

## Business Model

Our revenue streams include subscription fees for our AI-powered carbon footprint calculator, consulting services for carbon reduction strategies, partnerships for collaborative projects, and advertisement revenue from platform sponsorships. Our cost structure covers development, maintenance, marketing, and client acquisition expenses, ensuring efficient operations. Compared to traditional consultancies and basic online tools, our solution excels with advanced AI capabilities and seamless integration, leveraging proprietary machine learning models for precise carbon management. This positions us uniquely to drive innovation in sustainability and meet diverse market demands effectively.

## Future Directions

Our future plans include expanding into consumer markets with mobile integration, adding gamification elements like earning badges for energy reduction and suggesting eco-friendly transportation options. We aim to integrate with smart home devices and wearables for seamless user interaction. Enhancing predictive capabilities with advanced machine learning algorithms and extending functionality to include supply chain carbon footprint analysis are key objectives. Collaborating with sustainable travel companies and hotels will further promote eco-friendly practices, aligning with our commitment to innovation and sustainability.

## Conclusion

The AI-powered Carbon Footprint Calculator is positioned to revolutionize how companies and individuals manage their carbon footprint, promoting sustainability, compliance, and cost-efficiency. With a focus on real-time data and user engagement, this tool aims to make significant contributions to global carbon reduction efforts.