



# Driving Sustainable IT Practices for Environmental and Operational Excellence

Our solution supports the world's largest manufacturer of premium and commercial vehicles in maximizing operational efficiency and minimizing carbon footprint through a data-driven approach.

An aerial photograph of a lush green forest. A narrow path of trees leads from the bottom center towards a large, calm lake. The letters 'CO2' are written in the water, formed by a dense cluster of trees. The scene is framed by a large, stylized blue and white graphic element that curves around the bottom and right sides of the page.

CO<sub>2</sub>

## Overview

Amid increasing focus on environmental sustainability, large corporations are actively cutting emissions to reduce their carbon footprint. This strategic approach aligns with Environmental, Social, and Governance (ESG) principles, forging deeper connections with consumers who value such progressive practices.

We developed an intuitive sustainability dashboard that provides a detailed breakdown of total carbon emissions, offset costs, and quality scores. The solution empowered top management to visualize data via interactive graphs, facilitating informed decisions on emissions and carbon credits. Additionally, it objectively evaluates the impact of emissions on corporate finances.

## Client Profile

Headquartered in Germany, our client is the research and development center for the world's largest manufacturer of premium and commercial vehicles. The center focuses on research, IT engineering, and product development.

## Business Requirements

The client initiated a sustainability drive with the aim of reducing their carbon footprint. The primary objective was to develop a comprehensive application that would monitor carbon emissions from their data centers and hosting services.

- **Carbon emission tracking:** Devising dashboards to monitor carbon emissions from client-side portals, servers, clouds, and other hosting services.
- **Cost calculation for offset:** Ensuring the dashboard calculates the expenses associated with offsetting carbon emissions based on data.
- **Visualizing sustainability:** Crafting an intuitive dashboard that presents carbon emissions data via graphs and charts, enabling stakeholders to gain insights into sustainability performance.

## QBurst Solution

### Frontend Development:

- Designed wireframes and layouts to create dashboard designs highlighting sustainability metrics.
- Implemented intuitive user interfaces focusing on functionality and aesthetics.
- Incorporated real-time data visualization features using Apex charts.

### Backend Development:

- Developed a Spring Boot application for the Carbon Emission Calculator (CEC) engine to evaluate the environmental impact of digital applications.
- Implemented a Node.js application for LH engine to provide optimization suggestions based on Google Lighthouse reports.
- Containerized the CEC engine tool for easy deployment using Docker.

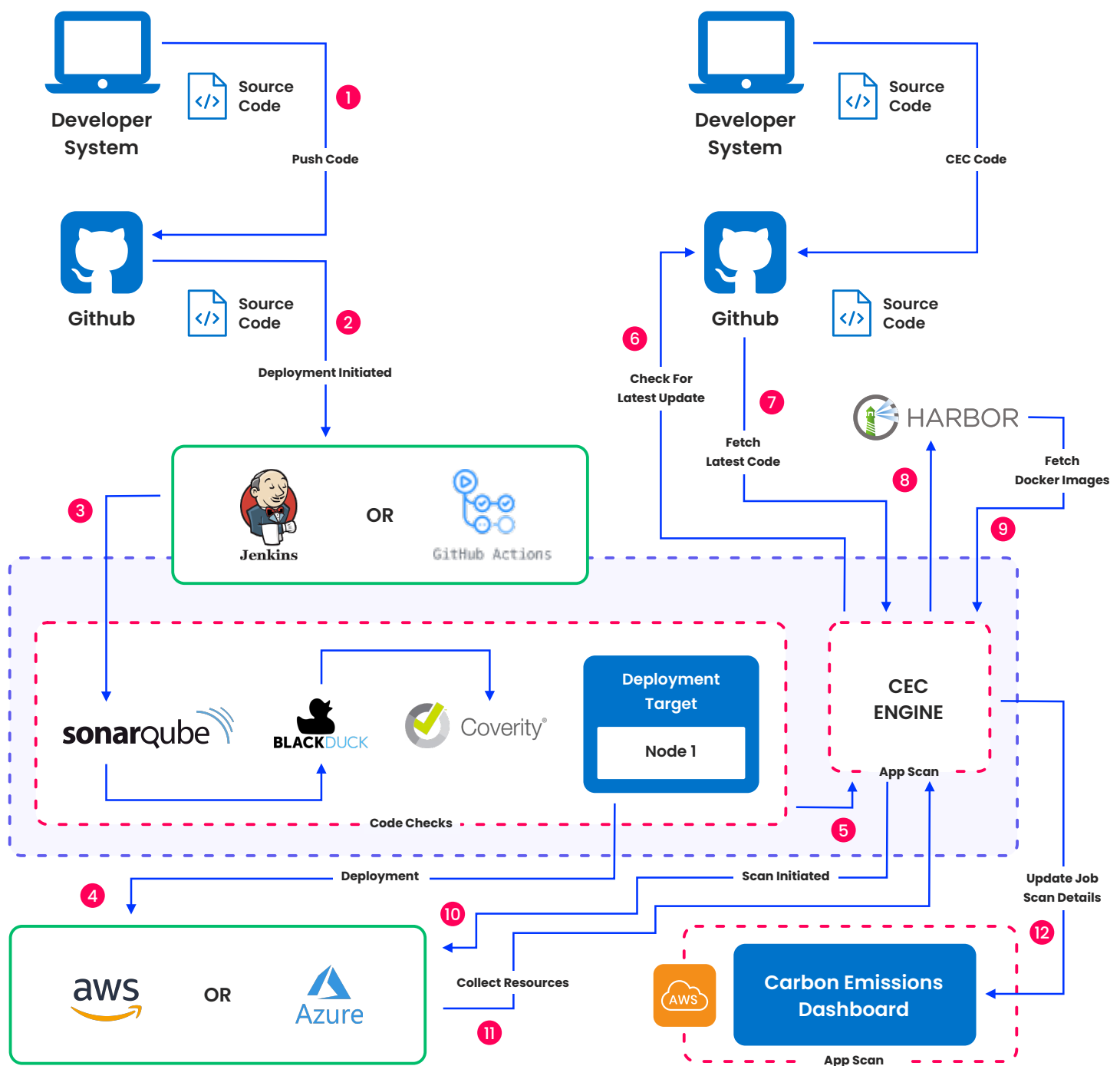
### Quality Assurance (QA):

- Conducted manual testing and API testing using Postman to ensure the reliability and functionality of the application.
- Validated database functionality using pgAdmin.
- Prepared documentation to ensure clear understanding and maintainability of the application.



## Technical Highlights

- Implemented containerization and hosted applications on Hyperion AWS EKS Cluster.
- Followed a technical workflow involving TypeScript for component creation, Redux for state management, React Router for routing, and React Query for API communication.
- Utilized Spring Boot for creating a Carbon Emission Calculator (CEC) engine.

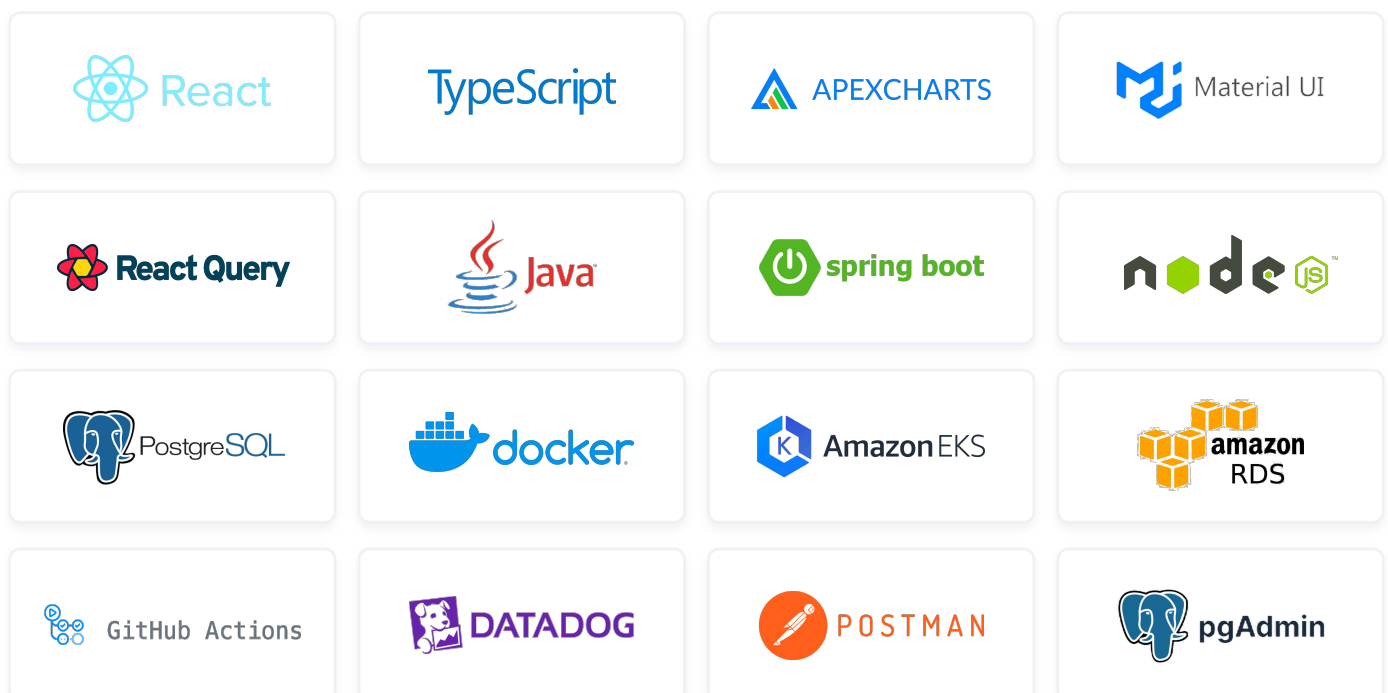


- Developed a Node.js application for LH engine, integrating with Google Lighthouse library for optimization suggestions.
- Containerized the CEC engine tool as a Docker image for ease of deployment using Jenkins or GitHub Actions.

## Key Features

- Real-time carbon emission tracking: Monitors carbon emissions from client-side portals, servers, clouds, and other hosting services in live mode.
- Carbon offset calculation: Offers a cost estimation for offsetting carbon emissions based on data.
- Optimizing code: Integration with Lighthouse reports identifies opportunities for code optimization.
- Project management: Efficient project management with comprehensive insights and collaborative functionalities.
- User administration: An administrative panel for managing users, requests, and project access.

## Technologies Used



## Benefits

- Real-time tracking of carbon emissions helped to identify areas where the company's carbon footprint could be reduced.
- Integration of carbon offset cost calculations enabled efficient allocation of resources for emission offsetting, supporting sustainability efforts while ensuring cost-effective environmental impact management.
- Integration with Lighthouse reports identified code optimization areas, reducing carbon footprint and potentially improving system efficiency and performance.
- Detailed project-specific data and graphical representations of emissions empowered stakeholders to make informed decisions, enabling targeted sustainability enhancements across projects.
- Project management features streamlined handling, fostering collaboration for implementing sustainable practices, leading to increased project efficiency.
- User administration panel facilitated efficient user access and request management, ensuring smooth collaboration and access across different projects.

