

— CASE STUDY

Measuring a Vehicle's Carbon Footprint Across 4 Lifecycle Stages

An AWS analytics platform that estimates emissions from raw materials to the road, giving automotive customers the data that emissions reporting rules now require.

— OVERVIEW

From Raw Materials to the Road, in One Emissions Model

The client, a global ratings and market analytics provider, set out to calculate the full carbon footprint of a vehicle. The model covers raw material extraction, manufacturing, transportation and vehicle operation, including fuel consumption.

The Challenge

More states and countries now require detailed emissions reporting, and automotive customers needed defensible numbers. Each lifecycle stage has its own data sources and calculation method, and all of them had to roll up into one estimate per vehicle. The platform had to align with global reporting standards to be accepted by the market.



Lifecycle emissions are a data integration problem before they are a sustainability problem. JRD worked through every phase with our analysts and delivered the platform on schedule.



Anonymous

Director of Sustainability Products, global ratings provider



WHAT WE DELIVERED

Four workstreams, one emissions platform



Lifecycle Data Integration

- Integrated data for materials, manufacturing, logistics and vehicle use
- Built a structured framework on Amazon S3 for storage, retrieval and processing
- Connected outputs to the client's existing enterprise systems



Emissions Calculation Engine

- Worked with the client's analysts to encode their methodology stage by stage
- Aligned calculations with global and industry reporting standards
- Rolled stage-level results into a total footprint per vehicle



Scalable Serverless Architecture

- Handled variable workloads with AWS Batch, Fargate, Lambda and Step Functions
- Stored results in DynamoDB and sent alerts through Amazon SNS
- Followed the AWS Well-Architected Framework throughout



Resilience and Cost Control

- Encrypted data at rest and in transit, with credentials held in Secrets Manager
- Configured cross-region disaster recovery and automated backups
- Tracked spend with AWS Budgets and Cost Management

— THE RESULT

One Model. Every Stage. Delivered on Time.

The client can now estimate a vehicle's total carbon footprint from a single platform, and show customers where in the lifecycle emissions can be cut. The platform shipped on schedule and runs on serverless infrastructure with cross-region recovery. It was built to integrate with the client's other JRD-delivered programs.

4

Lifecycle stages modeled

On time

Delivered to original schedule

300

Vehicle models covered