



## CASE STUDY

# From Annual to Daily Updates: How a Leading Cement Company Tracks and Reduces Its Emissions with Gardenia

## Executive Summary

*With Gardenia, the client tracks their emissions daily down to the product type level, and has granular insights to inform their reduction strategy.*

A leading South-Asian cement manufacturer partnered with Gardenia to develop an automated process for calculating their GHG emissions. Gardenia's platform replaced the client's manual reporting processes and expanded the coverage of the inventory to all GCCA-mandated scopes. Automation delivered several key benefits for the client. In addition to improving efficiency and currency of insights, it increased granularity in the data, enabling the client to assess their products and processes and inform their reduction strategy.

### Challenge

The client is working to gain better control over the climate impact of its operations. As a first step, it looked to optimise its emissions reporting practice. Gardenia's platform was selected to:


- Replace manual reporting with automated emissions tracking
- Expand the coverage of the GHG inventory to all GCCA-mandated scopes
- Increase the granularity of insights to enable comparison of cement types (OPC, PPC, Low Carbon) and reduction planning


### Solution

Gardenia provides an integrated solution that automates data capture from industrial systems and ERP, processes and enriches the data through AI-enabled pipelines, delivers daily emissions insights through interactive dashboards, and enables scenario planning for emissions reduction strategies.


### Results

With Gardenia, the client can now:

 **Track** their complete GHG inventory daily across all GCCA-mandated scopes

 **Analyse** emissions at product- and process- levels

 **Model** and compare reduction strategies

 **Make** data-driven decisions about sustainability initiatives



### About The Client

A mid-size cement manufacturer in South Asia, committed to sustainable development under the Cement Sustainability Initiative (CSI) and UN Sustainable Development Goals.

### Key Results

#### Daily

Updates to GHG Inventory

#### 100%

Inventory calculated using unit-based emission factors

#### 366,597+

Data points ingested and processed

#### 5

Systems connected to (DCS, XRF, CEMS, GPS, ERP)

#### 3

Cement Types profiled

### Gardenia Technologies'

Sustainability Analytics platform streamlines the gathering, analysis and reporting of your GHG inventory and key ESG metrics. Book a call to explore how we can help:

[gardeniatech.com/contact-us](https://gardeniatech.com/contact-us)



## Key Modules



### Data Factory

Data Consolidation | Validation



### Intelligence Layer

Data Enrichment | Calculations



### Dashboards

GHG Inventory | Insights



### Reporting

Annual GHG Emissions Report

## Client Inputs



Procurement



Documents (utility meter readings)



Process Monitoring (DCS)



Quality Control (XRF)



Environmental System (CEMS)



Logistics (GPS)

## Enrichment Data Added



Unit-level Emission Factors (LCA)



Process metrics (e.g. calorific value)



Location/Routes API



External Benchmarking

## From Manual to Automated Data Collection

Prior to partnering with Gardenia, the client used a manual, Excel-based workflow. The process involved manual data collection and meter readings, extraction, and performing calculations in Excel spreadsheets. The final output was an aggregated Excel file, covering Scopes 1 and 2 only and lacked documented input and assumptions visibility.

### The Gardenia Solution

Gardenia's built-in 'Data Factory' enables data collection from all internal and external sources. Automated data pipelines were set up to pull data directly from industrial systems (DCS, CEMS, XRF) and Procurement (ERP), delivering comprehensive sustainability data in real-time with minimal client effort.

Gardenia leverages GenAI tools to automate the extraction of data from sources such as invoices and utility readings. One of the tools in Gardenia's platform is AWS Textract, a machine learning service that automatically extracts data from scanned text documents and images. Textract is useful for automating the data extraction from plant meter readings - reducing time spent by the client on this routine data entry task.

## GHG Inventory Calculations

Gardenia implemented an automated emissions calculation process, ensuring that 100% of calculations were performed using unit-based emissions factors (EFs).

### Unlocking Insights in Client Data

Gardenia collected all required insights from existing client data sources - no new data or processes were requested. Through AI-enabled automation, the platform processes and enriches available client data to generate insights needed for a comprehensive GHG inventory, ensuring sustainability reporting doesn't increase data collection burden.

### Unit-Based Calculations

100% of calculations were performed using unit-based emission factors. Unit-based calculations apply emission factors that are specific to the unit being measured, taking into account factors like size, weight, materials, production processes, and location. This method provides a more accurate picture of a product's emissions profile compared to spend-based calculations, which estimate emissions based on the monetary value of goods and services purchased. The Gardenia platform facilitates unit-based calculations through our automated data extraction, enrichment and EF matching process.

### Expanding Coverage to GCCA-mandated Categories

By incorporating readily available additional data, Gardenia extended the coverage of the client's inventory to all GCCA-mandated emissions categories. Tracking emissions in line with GCCA recommendations enables the client to align with industry standards and benchmarks.



## The Gardenia Process

### 1 Diligence

Centralise your data and calculate a comprehensive GHG Inventory.

### 2 Insights

Explore emissions data and model reduction scenarios.

### 3 Capture

Define targets and identify actionable initiatives.

### 4 Track

Monitor progress and measure impact.

## Key Functionality



### Drill-down

Investigate the emissions profile of any product or process.



### Scenario Analysis

Compare reduction scenarios by impact in activity inputs, as well as the related emissions.



### Emissions Forecasting

Input forecast parameters such as growth rate, production plan, demand, product mix, revenue and margin, and forecast emissions for base and reduction scenarios.

## Product and Process Analysis

By leveraging automation to process and enrich millions of lines of client data, the platform is able to attribute emissions to specific processes and products throughout the value chain.

Emissions Breakdown						
Facility	Total Emissions (tCO2e)	Emissions Contribution (%)	Cement Sold (tonnes...)	Emissions/ Cement (kgCO2e/tonne)	Revenue (£)	Emissions/ Revenue (kgCO2e/£)
Plant_1		38.00%				
Plant_3		36.46%				
Plant_2		22.31%				
Office_1		3.23%				
Grand Total		100.00%				

Fig 1. Emissions Breakdown by Plant, Anonymised

## Reduction Simulation Module

The reduction simulation dashboard enables the client to evaluate reduction scenarios. For each scenario, the dashboard calculates the resulting emissions reduction in tCO2e, the percentage reduction achieved, and the cost difference compared to the original scenario.

Scope breakdown allows users to understand how each reduction strategy affects emissions across different scopes. For instance, the client observed that one Scenario significantly reduced Scope 1 emissions compared to the Original Scenario, but increased Scope 3 Upstream transportation emissions. This holistic view enables teams to weigh the trade-offs between emission reductions, financial costs, and the distribution of emission reductions across scopes.

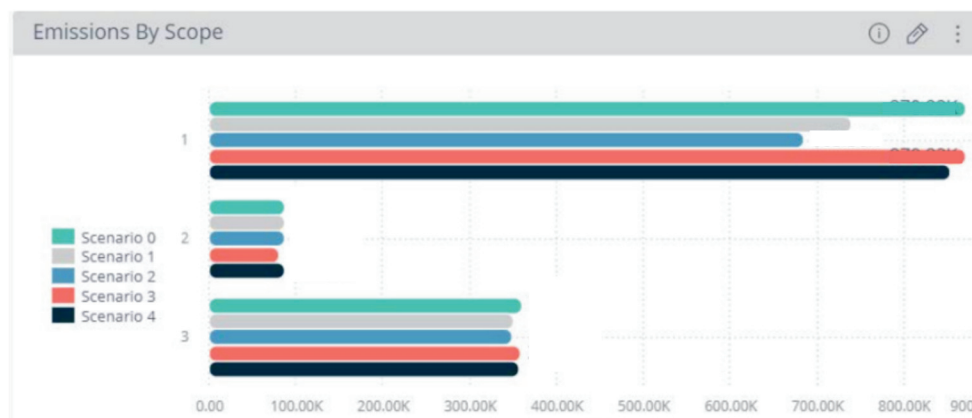


Fig 2. Emissions by Scope in the Reduction Scenario Dashboard, Anonymised



## Results

Gardenia's platform replaced manual workflows with an automated ESG data delivery system, enabling the client to track, report and reduce their emissions with ease.

With Gardenia, the client now has



### Scope 1, 2 and 3 Inventory

Audit-ready, company-level GHG inventory covering all GCCA-mandated categories



### Real-time Management Dashboards

Interactive dashboards with inventory and KPIs refreshed daily



### Reduction Scenario Modelling Tools

Scenario modelling dashboards for defining emissions reduction strategy

## Next Steps

The Gardenia platform enabled the client to set up comprehensive sustainability reporting from the data they already had. The client now has a live GHG inventory at hand, requiring no ongoing upkeep.

The team is freed to focus on strategy, and, with granular visibility into carbon impacts across the value chain, they are able to assess and implement the most effective reduction strategies.

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## About Gardenia Technologies

Gardenia Technologies builds platforms that streamline the gathering, analysis and reporting of your GHG inventory and key ESG metrics. As a certified AWS software provider, Gardenia combines technological innovation with environmental expertise to help businesses efficiently manage their sustainability goals.

Our solutions empower companies to meet regulatory requirements and drive long-term profitability by preparing for a sustainable future.

