



ResC4EU
RESILIENT SUPPLY CHAINS FOR EUROPE

Interactive Demonstrator

... for Climate Neutrality



Try it now



<https://resc4eu.greentwin.app/demonstrator-3>

Overview

This demonstrator allows users to explore how different sourcing strategies, manufacturing locations, and transportation modes for carbon fiber bicycle frames affect their environmental footprint measured as Global Warming Potential (GWP). Users can compare four alternative supply chain scenarios, each combining different fiber sources (Chinese vs. German vs. Japanese), material processing approaches (virgin vs. recycled), and production locations, against a baseline reference scenario. By visualising complete supply chain networks and breaking down production and transport emissions separately, users can understand the trade-offs between material sourcing (virgin vs. recycled), transportation modes (sea vs. road), and manufacturing locations, enabling informed decisions about sustainable supply chain design.

The demonstrator is publicly accessible via the ResC4EU platform:
<https://resc4eu.greentwin.app/demonstrator-3>

Sample Data

This demonstrator uses static sample data representing five supply chain scenarios for carbon fiber bicycle frame production, each combining different fiber sources, material processing approaches, and transportation routes. This documentation describes the data structures and values used throughout the demonstrator. The sample data is **not stored in the database**.

Data Structures

A **SupplyChainScenario** represents a complete supply chain pathway from raw material production through final assembly.

Field	Description
id	Unique scenario identifier (1-5)
name	Scenario name
description	Supply chain configuration and sourcing approach
stages	List of supply chain stages
productionGWP	Production and processing emissions (kg CO ₂ e)
transportGWP	Transport emissions across all segments (kg CO ₂ e)
totalGWP	Combined production and transport emissions (kg CO ₂ e)

GWP Calculation Methodology

Transport-related GWP is calculated using **distance-based emission factors** for each transport mode:

Transport Mode	Emission Factor
Sea	0.008 kg CO ₂ e/km
Rail	0.025 kg CO ₂ e/km
Road	0.085 kg CO ₂ e/km

Production and processing emissions vary by location and manufacturing efficiency, ranging from 240–1,340 kg CO₂e depending on the production process and material sourcing.

Data Consistency

Deterministic GWP Values

GWP values are deterministic - repeated selections of the same scenario always produce identical results. Total GWP combines transport emissions (distance × emission factor) and production/processing emissions to provide a comprehensive estimate of environmental impact across the complete supply chain.

GeoJSON Support

Maritime transport segments include GeoJSON features for visualization on interactive maps. Rail and road segments currently do not include geographic path data.

About the ResC4EU Project

The ResC4EU project aims to support EU businesses, especially small and medium sized enterprises (SMEs), to become more resilient and sustainable and be able to quickly adapt to supply chain disruptions such as experienced during COVID-19 crisis, geopolitical tensions or disasters by adopting advanced technologies. ResC4EU will provide an open space for collaboration, develop and provide models and tools that can assist SMEs in detecting and anticipating disruptions in their supply chains, and offering SMEs tailored support and training programmes as part of the ResC4EU Net-Zero Industry Academies. Further, manufacturing SMEs in need of implementing advanced technologies will be brought together with tech-savvy SMEs providing innovative solutions.

For more details: <https://cordis.europa.eu/project/id/101137643/results>



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Demonstrator Owner

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