ResC4EU
RESILIENT SUPPLY CHAINS FOR EUROPE

Evaluating Supply Chain Resilience among European SMEs
The ResC4EU Project Case Study

White Paper, August 2026

Dr. Debarshee Bhardwaj
Institut für Seeverkehrswirtschaft und Logistik, Bremen, Germany

Dr. Violeta Damjanovic-Behrendt
GreenTwin GmbH, Austria

Inese Murniece
Latvian IT Cluster, Latvia

Kunal Chaudhari
Fraunhofer IGCV, Augsburg, Germany

ISL Institut für Seeverkehrswirtschaft und Logistik

GreenTwin GmbH
get resilient and circular

Latvian Digital Innovation Hub
POWERED BY LATVIAN IT CLUSTER

Fraunhofer IGCV

Funded by the European Union

About the ResC4EU Project

ResC4EU, Resilient Supply Chains for Europe [1] is a European Commission-funded project designed to strengthen the resilience, sustainability and adaptability of industrial supply chains, with a particular focus on small and medium-sized enterprises (SMEs). European supply chains are increasingly exposed to geopolitical tension, transport bottlenecks, market volatility and structural dependencies. ResC4EU helps companies move from reactive crisis management toward a systematic, data-informed and technology-enabled approach to supply chain resilience.

The project combines digital tools, training and cross-sector matchmaking to help SMEs understand their vulnerabilities and identify practical pathways for improvement. One pillar of this wider effort is the ResC4EU Digital Framework for Risk and Resilience Evaluation [2], which brings together a Supply Chain Resilience Self-Assessment Tool, a Multimodal Risk Alert Tool and a Global Warming Potential Tool. This white paper specifically focuses on the Supply Chain Resilience Self-Assessment, with particular emphasis on the Resilience Score service and the public demonstrator that widens access to the ResC4EU tolls for organisations across Europe.

Why a Resilience Score

Conventional risk-management tools [3] [4] often rely on extensive historical data or enterprise-scale IT infrastructure, making them inaccessible to SMEs by design. Moreover, static self-assessment models may create a false sense of security by failing to adapt to evolving risk conditions.

The Resilience Score addresses this gap by converting an organisation's own assessment of its risks and strengths into a standardised, benchmarkable score on a 0-100 scale. It is a quantified measure of how resilient a supply chain is. The score is calculated through a dedicated scoring API and complemented by AI-generated, context-aware commentary. This provides SMEs, which typically lack dedicated risk-analytics teams, with a fast and accessible way to understand their current supply chain resilience position, identify areas for improvement, and prioritize actions.

The Resilience Score Service within the ResC4EU Platform

The Resilience Score is calculated by an API, developed by the Institut für Seeverkehrswirtschaft und Logistik (ISL), Bremen, and integrated into the ResC4EU B2B Platform [5], operated by GreenTwin GmbH (GTW). It produces three complementary metrics, each normalised to a 0–100 scale:

- Resilience Score: An overall measure of the organisation's capacity to withstand and recover from supply chain disruption.
- Vulnerability Score: The organisation's exposure to supply chain risks and potential disruptions.
- Capability Score: The organisation's readiness and response capacity.

Funded by the European Union

Companies registered on the ResC4EU Platform can calculate their Resilience Score from the Company Dashboard after completing the relevant assessments of their vulnerabilities and capabilities. The Resilience Score calculation remains disabled until both required assessments have been completed, ensuring that the resulting score is meaningful and not based on partial data.

Traditional companies complete separate Vulnerability and Capability Assessments covering environmental, geopolitical, supply-side, demand-side, infrastructure, financial and strategic risk categories. These risks are assessed against six key capability dimensions, including flexibility, collaboration, visibility, anticipation, recovery and dispersion.

Tech-savvy companies, innovators and consultancies instead complete a Technology Assessment, combined with the same capability dimensions but adapted to a technology-driven context.

Visualising the Score

Calculated Resilience Score outcomes are presented through an interactive speedometer visualisation (Figure 1): an arc gauge with colour-coded zones (red 0–33, yellow 34–66, and green 67–100), an animated needle, and a large central figure displaying the overall score. Dedicated indicators also display the vulnerability and capability scores, providing a clear view of the organisation's supply chain resilience profile.

Resilience Scores are stored at the company level together with a calculation timestamp, ensuring that all users within the organisation see the same, up-to-date figure. Scores that are more than 30 days older trigger a staleness warning and a subtle visual fade, encouraging organisations to reassess their resilience as risk conditions evolve.

Funded by
the European Union

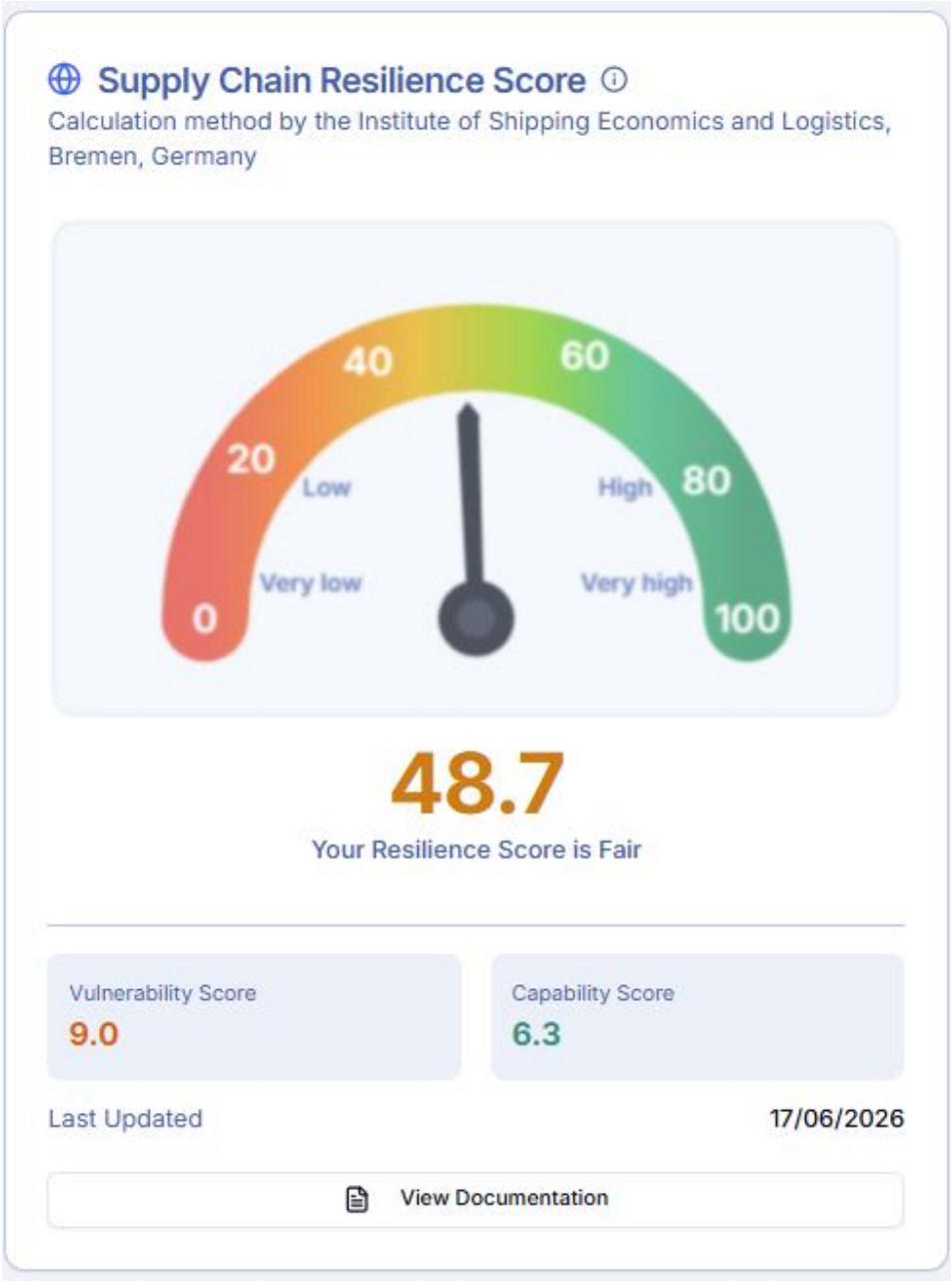

Figure 1: Supply Chain Resilience Score – User Visualization

Funded by
the European Union

How the Score is Calculated

The Resilience Score API incorporates company metadata, country, sector, size and industry classification, so that the scoring reflects the organisation's actual operating context rather than applying a one-size-fits-all formula. It uses standardised European country codes and sector codes for industries, and applies a methodology developed through academic and industry collaboration within the project. Assessment responses and anonymised company metadata are securely transmitted from the ResC4EU Platform's Company Dashboard, which is accessible only to authorized and authenticated users of registered companies, to the scoring API. The API processes the submitted data and returns the resilience, vulnerability and capability scores.

The Resilience Score Service as a Public Demonstrator within the ResC4EU Platform

In addition to being offered exclusively to companies registered on the ResC4EU Platform, the Resilience Score service is also integrated into one of the project's four public demonstrators. The Demonstrator for Supply Chain Resilience is publicly accessible to everyone and is designed to broaden the use and uptake of the project's services and tool, which is a key objective of this Coordination and Support Action (CSA).

In addition to the Resilience Score API, the demonstrator provides free-tier access to AI-generated interpretations of the public vulnerability and capability assessments and the resulting Resilience Score. This functionality translates assessment results and numerical scores into clear, plain-language insight, helping users better understand their resilience profile and identify areas that may require attention.

How the Demonstrator for Supply Chain Resilience Works

Users begin by entering a minimal company profile, including the company name, sector, size, country and company type (Traditional, Tech-Savvy or Manufacturing-Focused). This information provides the context needed by both the Resilience Score API and the AI analysis to tailor their output to the organisation's specific profiles.

Similar to the Resilience Score service, users assess their organisation across up to 65 optional parameters, divided into two main sections: vulnerabilities and capabilities. Users can also pre-load sample vulnerability and capability assessment data, allowing them to explore the questionnaire in practice and gain a better understanding of the assessment process and results. These pre-loaded sample data can be further extended with user's own assessment data. Finally, the assessment data can be downloaded and re-uploaded through the ResC4EU Platform's Company Dashboard, enabling users to continue their assessment after their registration.

Funded by
the European Union

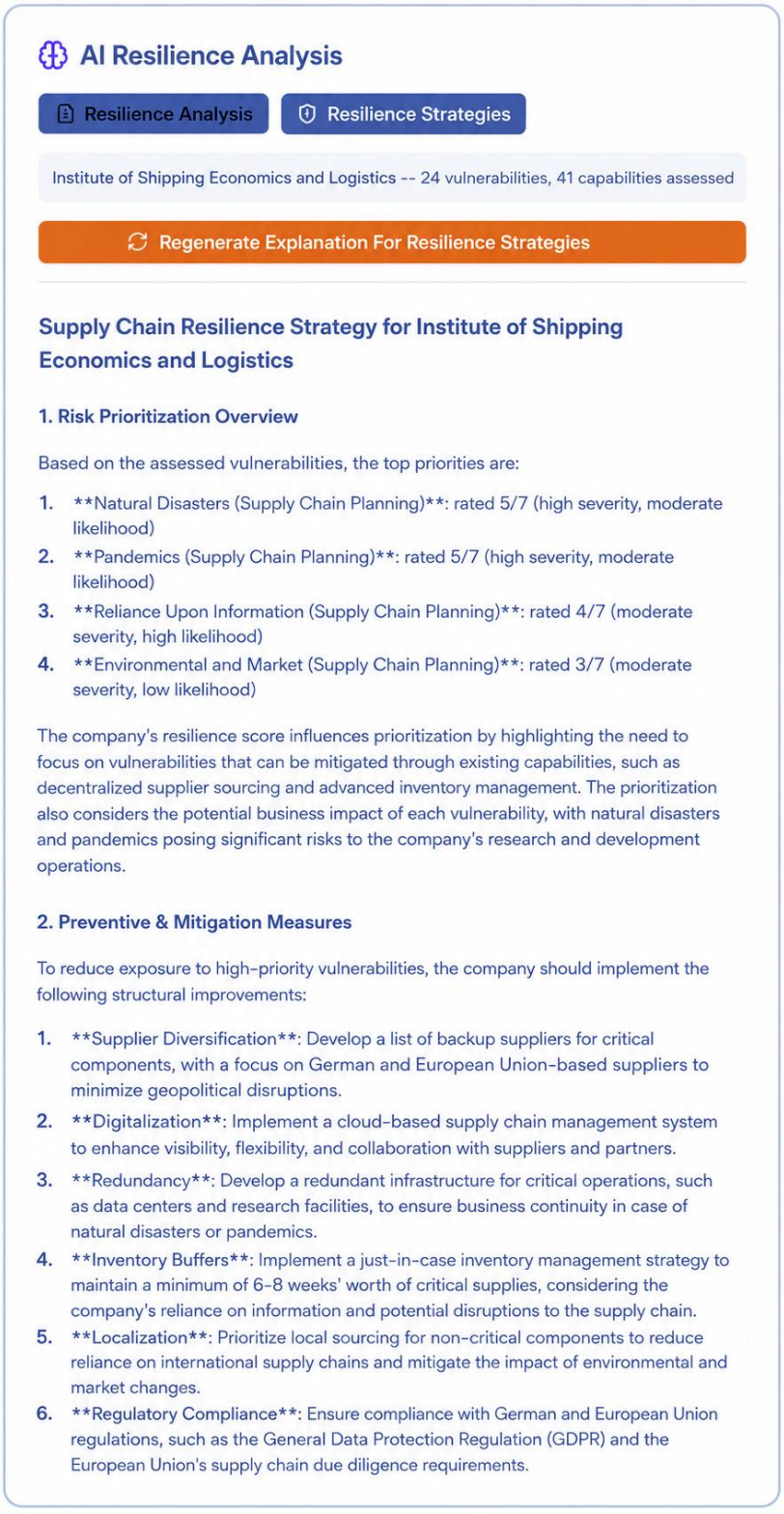

Figure 2: AI-Generated Explanations as Supply Chain Resilience Strategies

Funded by
the European Union

Submitting the Vulnerability and Capability Assessment triggers two parallel processes. First, the Resilience Score API calculates the resilience, vulnerability and capability scores and visualizes the results through the speedometer gauge. In parallel, the AI generates a tailored analysis comprising a summary of the resilience score, the organisation's critical vulnerabilities, its existing strengths, and two targeted recommendations for improving resilience (Figure 2). All insights are contextualized to the company's profile.

Trustworthy AI and Data Privacy

Because the platform layer adds AI-generated interpretation on top of the Resilience Score, ResC4EU includes a built-in AI Ethics Assessment aligned with the EU AI High-Level Expert Group's Assessment List for Trustworthy Artificial Intelligence (ALTAI). After reviewing the calculated scores and their AI-guided interpretations, users are invited to rate the AI output using a five-point agreement scale across five dimensions: transparency & explainability, accuracy & reliability, fairness & non-discrimination, human autonomy & control, and privacy & responsibility. The AI Ethics Assessment is available in seven languages, while user feedback is handled confidentially and used to monitor and continuously improve the platform's AI governance.

Specifically, calculating a Resilience Score requires sharing assessment data through ISL's API for processing. Only vulnerability and capability responses, together with hashed, non-reversible company and user identifiers and coded metadata on country, sector and company size, are transmitted via encrypted HTTPS. Company or user names, and supplier information are never transmitted. GTW and ISL operate under data protection agreements aligned with the GDPR (General Data Protection Regulation), ensuring that individual companies cannot be re-identified from the data shared.

Conclusion

The Supply Chain Resilience Score transforms a traditionally qualitative, intuition-driven judgement - *how exposed is my supply chain, and how prepared am I to respond?* - into a structured, benchmarkable and repeatable measurement. By combining a research-grade scoring methodology with an accessible, AI-interpreted public demonstrator developed in the project, ResC4EU lowers the barriers for European SMEs to begin systematic resilience management. Its built-in ALTAI-aligned Ethics Assessment further support transparent, fair and accountable use of AI assistance.

Funded by
the European Union

Used alongside the wider ResC4EU framework, the Resilience Score provides companies with a practical basis for strengthening the resilience, competitiveness and sustainability of Europe's industrial supply chains.

For more details on the open datasets used with the Demonstrator for Supply Chain Resilience, consult [9] [10].

References

[1] ResC4EU. Welcome to the ResC4EU Project & Initiative. Retrieved July 24, 2026, from https://www.resc4eu.com/
[2] The ResC4EU Digital Framework for Risk and Resilience Evaluation for European SMEs - White Paper, April 2026. Available at: https://www.resc4eu.com/library.html
[3] DEKRA. (2024). Supply Chain Risk Management (SCRM) Self-Assessment Tool. Available at: https://www.dekra.com/en/scrm-self-assessment/
[4] Resilinc. (2024). AI-Driven Supply Chain Risk Management Platform. Available at: https://resilinc.ai/
[5] ResC4EU B2B Platform. Retrieved July 24, 2026, from https://resc4eu.greentwin.app/app/internal-documentation/resilience-score-company-level
[6] European Commission. (2023). The Green Deal Industrial Plan. Retrieved July 24, 2026, from https://commission.europa.eu/topics/competitiveness/green-deal-industrial-plan_en
[7] ResC4EU D4.1 Risk and Alerts Framework for Multimodal Logistics and Supply Chain Resilience, 2025. Available at: https://www.resc4eu.com/library.html

[8] Bhardwaj, D., & Kinra, A. (2025). Developing a PLS-SEM-based digital tool for self-assessing supply chain resilience: principles for dynamic weighted scoring and vulnerability-capability matching. IFACPapersOnLine, 59(10), 1600-1605. https://doi.org/10.1016/j.ifacol.2025.09.269
[9] Demonstrator and Dataset Descriptions. Available at: https://zenodo.org/records/21629071
[10] Demonstrator Open Dataset. Available at: https://zenodo.org/records/21628689

Contact

Funded by the European Union

Dr. Debarshee Bhardwaj
Project Lead and Researcher

Institut für Seeverkehrswirtschaft und Logistik
Universitätsallee 11 - 13
28359 Bremen, Germany
Email : bhardwaj@isl.org

Dr. Violeta Damjanovic-Behrendt
Founder & CTO

GreenTwin GmbH
Valentinhaft 45
5222 Munderfing, Austria
Email: vdb@greentwin.at

Inese Murniece
Project Manager

Latvian IT Cluster
Dzirnavu Street 91, k-3, 2nd Floor
LV-1011 Riga, Latvia
Email: inese.murniece@itbaltic.com

Funded by
the European Union

ResC4EU
RESILIENT SUPPLY CHAINS FOR EUROPE

Kunal Chaudhari,
Research Associate

Fraunhofer Institute for Casting, Composite and Processing Technology IGCV
Am Technologiezentrum 10
86159 Augsburg, Germany Email:
kunal.chaudhari@igcv.fraunhofer.de

Fraunhofer IGCV

The portraits of Dr. Debarshee Bhardwaj and Kunal Chaudhari have been AI-enhanced and modified for illustrative purposes.

Funded by the European Union

ResC4EU
RESILIENT SUPPLY CHAINS FOR EUROPE

Please visit our ResC4EU website & follow us on LinkedIn to be up to date on our activities:

www.resc4eu.com LinkedIn ResC4EU contact@resc4eu.com

Funded by the European Union

Disclaimer: Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the granting authority (HADEA - European Health and Digital Executive Agency). Neither the European Union nor the granting authority can be held responsible for them.

Funded by the European Union