

SUSTAINABILITY INTELLIGENCE FOR SUPPLY CHAIN RESILIENCE

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Dr. Violeta Damjanovic-Behrendt, GreenTwin GmbH, Austria

Introduction

Modern digital platforms are transforming B2B collaboration by leveraging AI-driven automation for decision-making, and semantic technologies to enhance document generation and exchange, and enable contextual reasoning. By streamlining transactions and amplifying network effects, these platforms foster more efficient and dynamic business interactions. They help companies strengthen the resilience and sustainability, while unlocking new business opportunities at corporate and sectoral levels. The ResC4EU Supply Chain Resilience Platform¹ builds on these advancements to help European SMEs anticipate key challenges affecting their supply chains and collaborate more effectively through tailored resilience services.

By integrating ESG (Environment, Social, and Governance) sustainability principles into its digital services, the ResC4EU platform enables companies to manage risks more responsibly, comply with evolving regulations, establish sustainable partnerships, and improve their resilience. This integration also enhances transparency across supply chain operations and supports coordinated, trust-based decision-making among stakeholders.

This poster presents the latest development of the ResC4EU platform, created under the Horizon Europe project ResC4EU², and illustrates two services enabling collaboration through sustainable, paperless document exchange, and automated matchmaking for supply chains.

Sustainability-Driven Collaboration

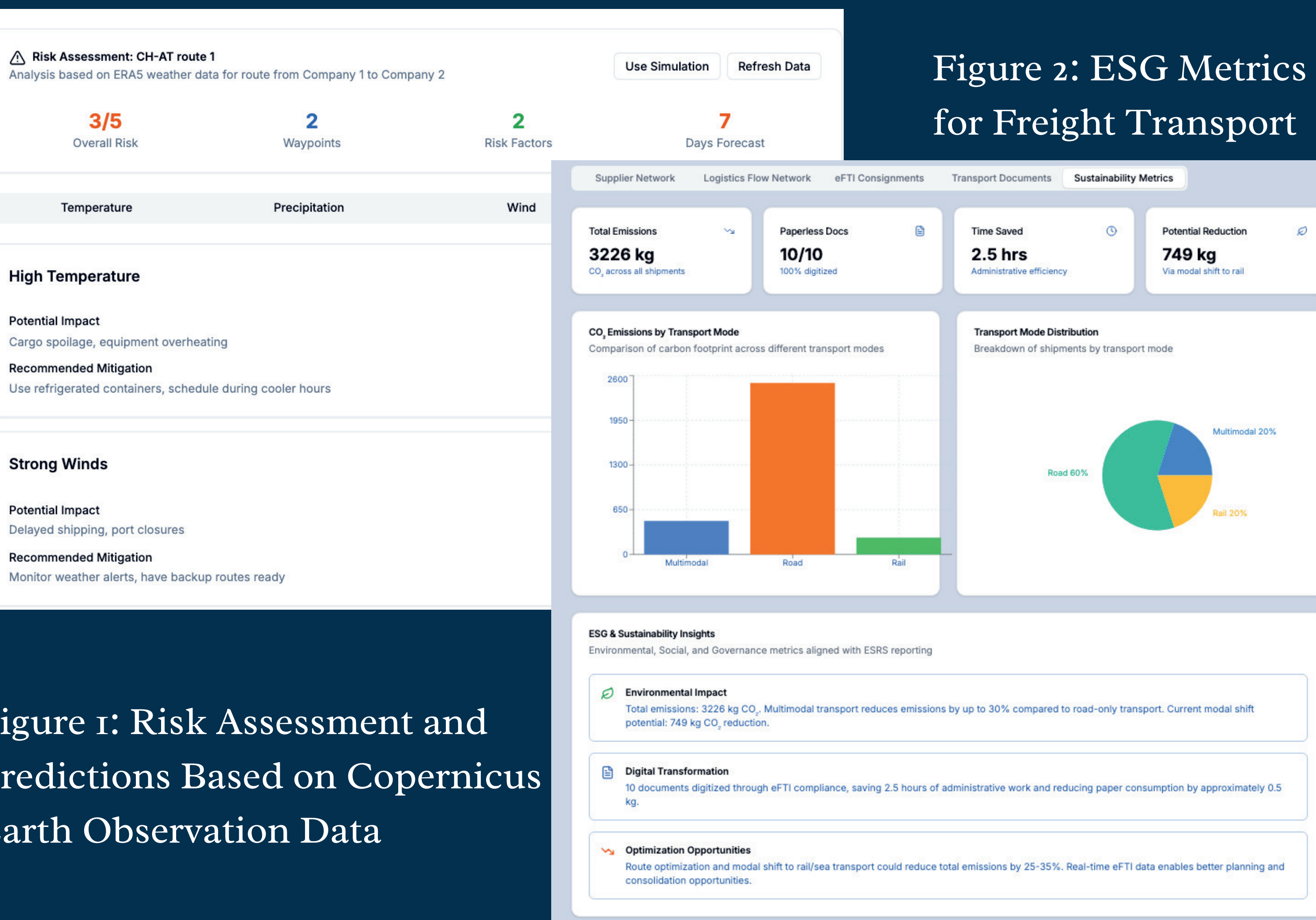
Integrating ESG principles and objectives into business strategy is essential for achieving long-term resilience, trust, and competitiveness. In ResC4EU, we develop services that help companies identify systemic risks and align on emission-reduction targets, thereby strengthening the resilience of their supply chains.

Figure 1 illustrates the platform's risk assessment and forecasting capabilities for logistics routes, based on historical ERA5 weather and climate satellite data. The system correlates processed weather information with supply chain routes, identifies potential disruption risks, and generates risk factors with severity ratings and probability assessments.

To ensure interoperation with logistics and transport systems, the ResC4EU data model is aligned with the eFTI (Electronic Freight Transport Information) reference model. This alignment supports the generation of transport documents, enriched with transport-related ESG and sustainability insights. **Figure 2** presents the Sustainability and ESG Metrics Dashboard for freight transport, displaying parameters such as total emissions, number of paperless documents generated, time saved, and potential emission reductions. It also provides graphical visualisations of CO₂ emissions by transport mode, and a breakdown of shipments by transport mode (e.g. road 60%, multimodal 20%, rail 20%).

Automated Matchmaking for Supply Networks

The automated matchmaking service in ResC4EU is implemented as a multi-layered intelligent system designed to strengthen both sustainability and resilience across European supply chains. First, it dynamically matches companies facing specific vulnerabilities with those offering digital solutions to address such challenges; for example, tools for disaster resilience and early warning, automated emergency response protocols, or intelligent geopolitical monitoring systems (**Figure 3**). Second, the system applies sustainability intelligence to connect companies based on their verified sustainability performance (see **Figure 2**) and demonstrated resilience capacity. This ensures that recommended partnerships advance both environmental goals and stability of supply chains. Third, the system incorporates semantics-based, context-aware intelligence that accounts for regional dependencies, sectoral risk profiles, and policy priorities. This enables matchmaking that aligns with the broader objectives of EU resilience, decarbonisation, and strategic autonomy (**Figure 4**). Together, these three layers create a dynamic, evidence-based network that supports supplier diversification and the identification of alternative suppliers, fostering adaptive and sustainable operations. The innovative partnerships formed through the ResC4EU platform help companies prepare for sustainable investments, and promote the scalable adoption of resilient supply chain practices.



Conclusion

The two showcased services of the ResC4EU platform share the concept of embedded sustainability intelligence, demonstrating how it drives collaboration and automation. By linking sustainability and resilience, these intelligent platform services augment supply chains making them both greener and more robust. Furthermore, they empower companies to adopt proactive mitigation strategies, ensuring continued operational resilience in the face of evolving challenges.

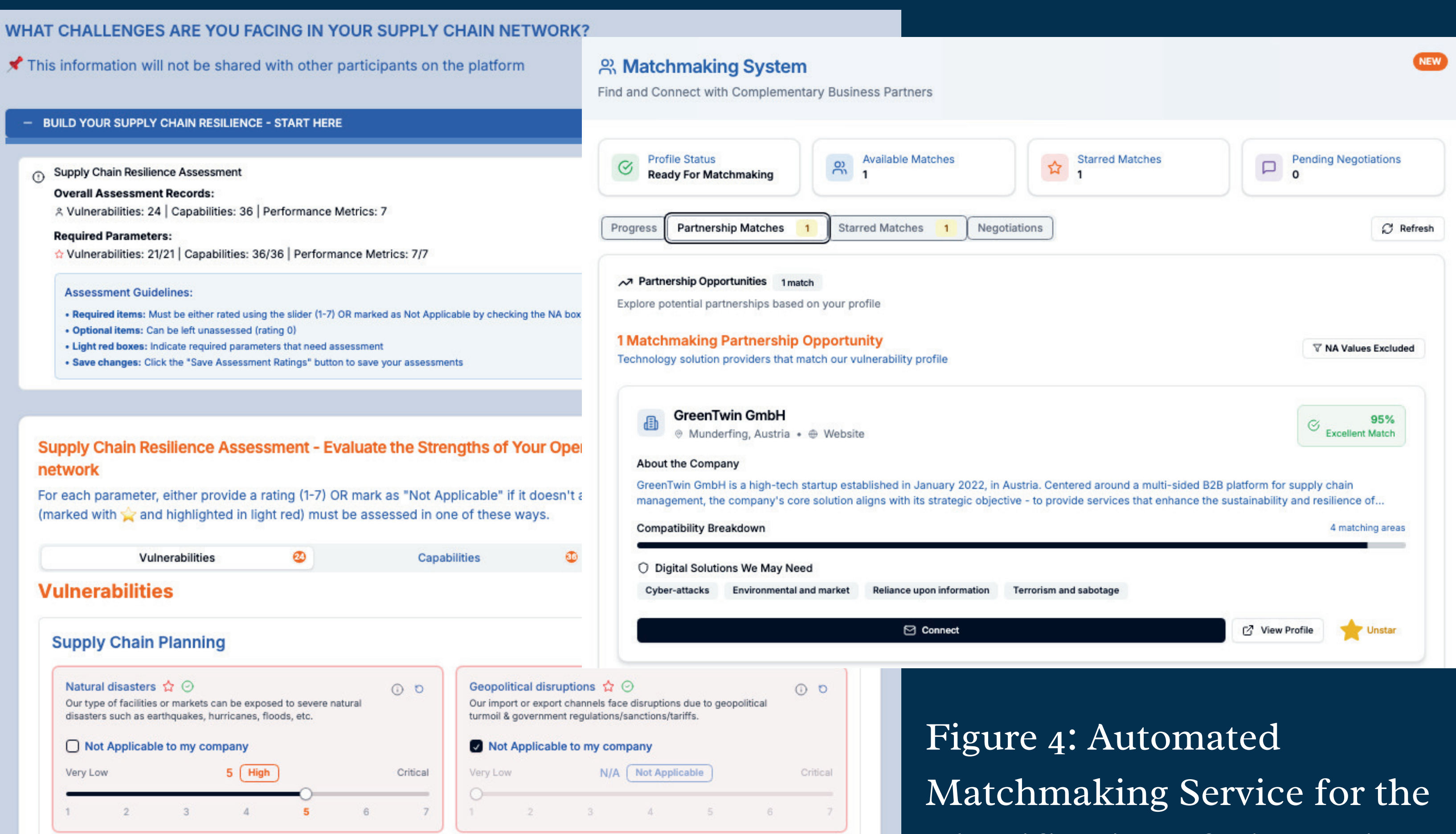


Figure 3: Assessment of Supply Chain Vulnerabilities and Capabilities

Figure 4: Automated Matchmaking Service for the Identification of Alternative Partners

Acknowledgements

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References

- ¹ ResC4EU B2B platform: <https://resc4eu.greentwin.app/>
- ² ResC4EU project: <https://www.resc4eu.com/>