

# Towards multimodal marketplace platform for SCOPE 3 emission-aware logistics – designing ADMIRAL marketplace

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# ADMIRAL in a nutshell

<https://www.admiral-project.eu/>



- **ADMIRAL** – Advanced multimodal marketplace for low-emission and energy transportation
- 01/05/2023–30/04/2026
- **Partner Countries:** Germany, Finland, Greece, Italy, Croatia, Lithuania, Portugal, Slovenia, Spain
- **4 Pilots:** Portugal–Spain, Slovenia–Croatia, Lithuania, Finland
- **Practical result** will be the **Admiral marketplace**, which connects logistics service providers and cargo owners and manages the logistics chains and related emissions. Strong emphasis to emission visibility (estimation, collection and reporting) and reduction.

Transportation accounts for 25% of greenhouse gas emissions in Europe.

Focus has been on SCOPE 1 (*primary emissions*) and SCOPE 2 (*energy use*) emissions not so much in SCOPE 3 (*indirect emissions that occur in the upstream and downstream activities of an organization*) emissions.

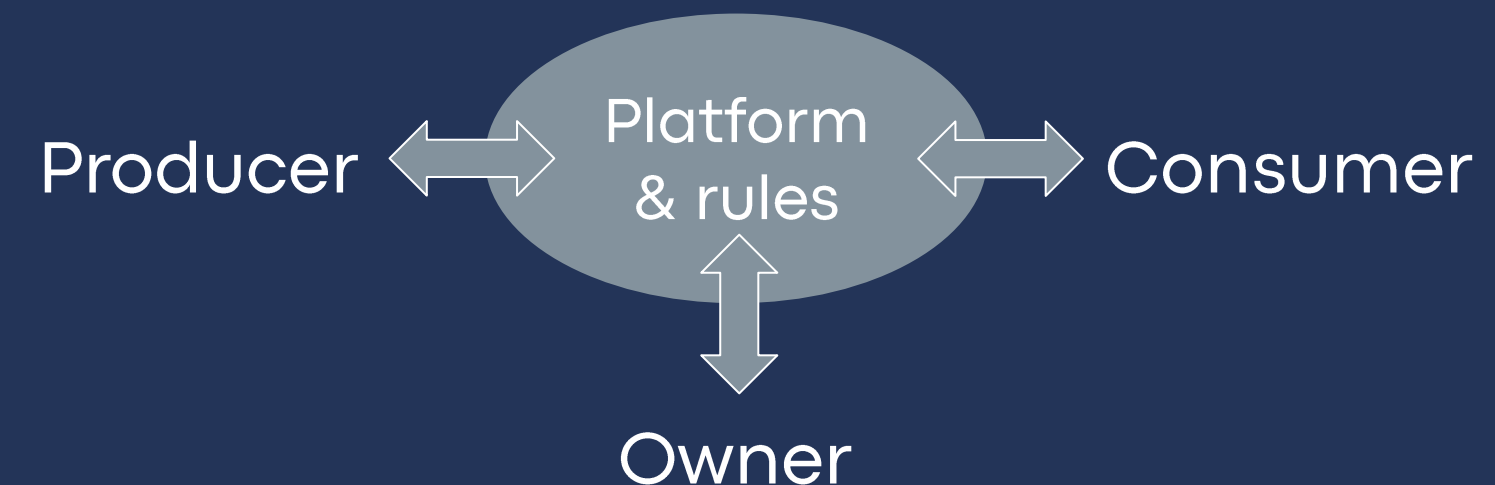
# Digital platforms

- Digital platforms:
  - Digital platforms are business models that use online infrastructure to facilitate interactions between groups.
- We can distinguish platforms e.g. on the basis of their:
  - **principal activity:** Transaction – Innovation
  - **number of sides interacting on platform:** one-sided, two-sided, multi-sided
  - **purpose:** marketplaces, social media, application development, data sharing, ...
  - **participant types:** B2C, B2B, C2C



Pull – Facilitate – Match !

*Open participative infrastructure for interactions and governance conditions for them.*



# Research design

- Our aim is to better understand the dynamics how digital platform and ecosystem emerges and evolves in the context of emission-aware logistics.
- Gathering qualitative research data using semi-structured interviews and workshops from different stakeholders, such as, cargo owners, LSPs, platform owner, IT houses.
- Close collaboration between platform owner and researchers.
- Platform canvas –based approach used in digital platform concepting.
- Collecting longitudinal data<sup>1</sup> about the ADMIRAL digital marketplace ecosystem emergence:
  - Vision, actors, technical development
  - Decisions, engagement, communication
  - Challenges encountered

*"Time-series" data collection*

1) Valkokari, K., Hemilä, J., & Kääriäinen, J. (2022). Digital Transformation - Cocreating a Platform-Based Business Within an Innovation Ecosystem. *International Journal of Innovation Management*, 26(3), Article 2240016. <https://doi.org/10.1142/S1363919622400163>

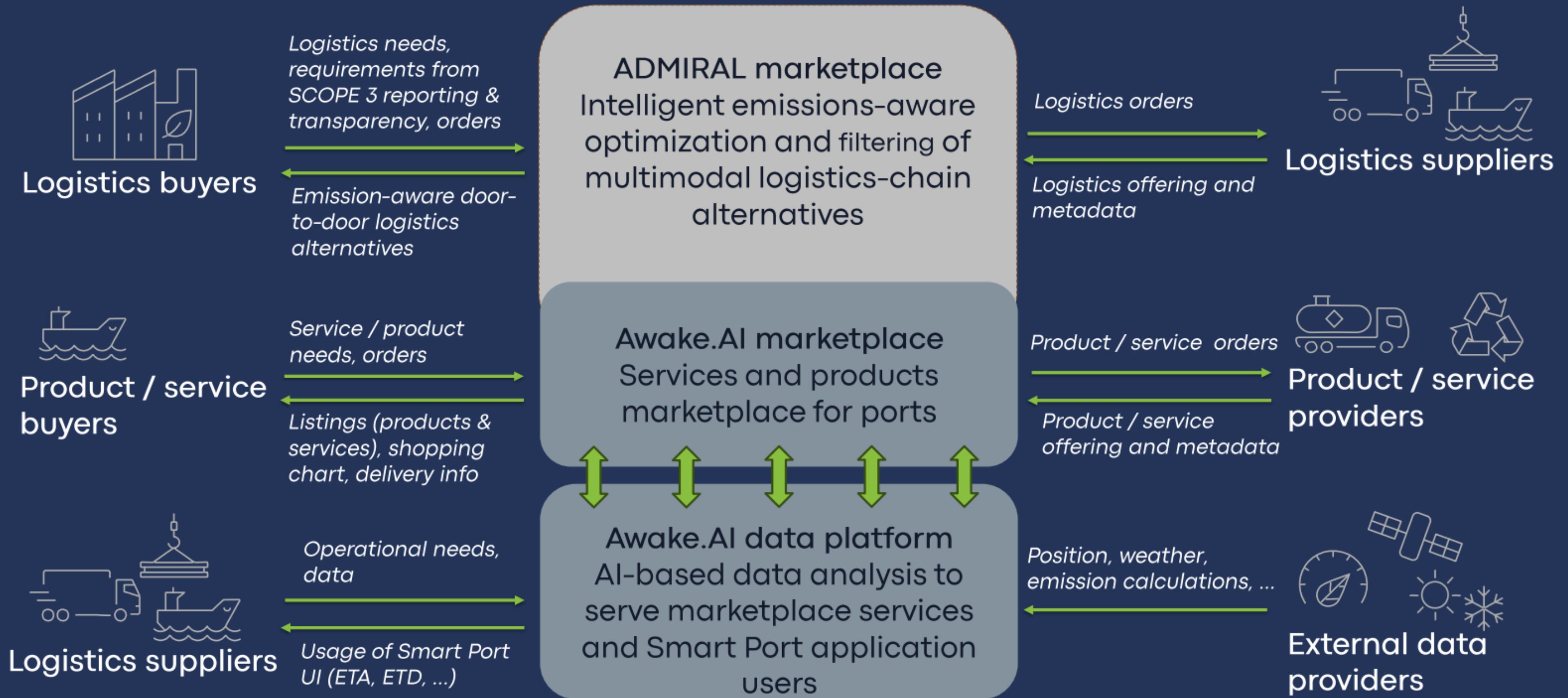
# Ongoing research

- The starting point, problem and needs for the marketplace:
  - *Mikkola, M., Kääriäinen, J., Hinkka, V., Pyykkö, H., Mulhern, E., Salminen, S. (2024). The opportunities of using a logistics service marketplace to decrease emissions of transport and logistics industry, Transport Research Arena (TRA2024), Dublin.*
- Drivers and barriers related to the ADMIRAL marketplace:
  - *Markuceviciute-Vincke, I., Hinkka, V., Kääriäinen, J., Mikkola, M., & Mulhern, E. (2024). Drivers and barriers for achieving green benefits in digital logistics platforms. In Logistics and Supply Chain Management in a Risky and Uncertain World: NOFOMA 2024 proceedings The Nordic Logistics Research Network (NOFOMA). <https://doi.org/10.5281/zenodo.12180260>*

# ADMIRAL Marketplace concept

Development does not start from scratch:

- Existing data platform
- Existing marketplace for ports



# ADMIRAL Marketplace concept

The ADMIRAL marketplace connects emission-conscious cargo owners and logistics service providers to enable low-emission logistics chains

Concept has been used for stakeholder discussions to build common understand of concept and get feedback to support future implementation and piloting



Improved visibility between buyers and sellers by sharing information about emissions already at the procurement stage

Emissions reductions can be gained also without significant physical investments by increasing the visibility.

Going beyond transaction platform by enabling building complementary services on the top of the platform – i.e. innovation platform.

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- Characterization:
- Transaction & Innovation platform
  - Multi-sided
  - Marketplace & application development
  - B2B



# Conclusions – *marketplace is in design phase*

- Regulation drives towards emission-aware decision making, visibility and reporting in logistics.
- Digital platforms could be used as online infrastructures to facilitate interactions between different groups (like buyers and sellers):
  - Enables data sharing, visibility and matchmaking
- The ADMIRAL project builds an emissions-aware logistics marketplace that:
  - Utilises an existing AI-based data platform
  - Builds on top of the existing piloted port services marketplace
  - Contains both transaction and innovation platform features
- The emergence and evolution of digital platform and its ecosystem is complex:
  - More longitudinal research and practical cases are needed to gain understanding and experiences how digital platforms, and their related ecosystems emerge and evolve in different industrial contexts.



# Questions

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## Towards multimodal marketplace platform for SCOPE 3 emission-aware logistics – designing ADMIRAL marketplace

Logistics operations embedded in global supply chains generate a significant amount of greenhouse gas emissions which, until recently, have only been viewed from a more holistic perspective. Scope 3 emissions include indirect emissions that occur in the upstream and downstream activities of an organisation e.g., from transportation providers, suppliers, retailers, employees, and customers. Scope 3 emissions make up a majority of the carbon footprint of most organizations, but studies show that they are hard to measure and manage in the context of companies due to several reasons (Kojo, 2023), e.g., data availability and quality. Also, the reporting and verification of Scope 3 emissions are not consistent and transparent. Therefore, we need new solutions that can make it easier to collect, combine and share emissions data in the logistics service chain.

End-to-end visibility in the logistics chain goes beyond a focal company's boundary and extends to freight ecosystem partners, such as customers, suppliers, freight forwarders, and logistics service providers. This requires a means to organise the collaboration. The concepts of digital platforms and digital ecosystems have emerged within this context bringing different ecosystem stakeholders together, allowing them to communicate, share data and interact and, therefore, also simplify the complexities of day-to-day transactions among cargo stakeholders (Wang & Sarkis, 2021).

Our study provides insights on how a digital logistics marketplace including emissions data is developed in a project consortium consisting of four development cases connected by the marketplace. The cases focus on different logistics service operations (truck, train, port). The three-year development process is still ongoing, and at this point we can report the observations and findings from the first year.

This research follows a qualitative approach to examine the development of a digital marketplace for emissions-aware logistics services in the context of the EU co-funded project ADMIRAL. Currently we have an initial concept of an emission-aware logistics marketplace as well as the first experiences of defining such a platform. However, several issues are challenging the development of such a marketplace – such as data sharing, governance model and overcoming the chicken and egg problem. The marketplace aims to facilitate interaction between the sellers (producers) and the buyers (users). The sellers operating on the platform offer their logistics services according to rules set by the platform operator. The emission-aware buyers acquire these services via the platform. The marketplace is not only a transaction platform, but it also provides capability for application developers and integrators to build and integrate applications on top of the marketplace utilising the developer portal. The marketplace operator facilitates the operation and enables value creation between the different parties of the platform. Furthermore, the operator determines and controls who can access the platform and under what conditions (e.g., curation). Thus, the marketplace has many challenges to tackle, and it remains to be seen how we will succeed in our journey towards a multimodal marketplace platform for Scope 3 emission-aware logistics.

### References

Kojo, L. 2023. Transportation-related Scope 3 emissions reporting and reduction in supply chains: the effects of upcoming regulation. Master's thesis, University of Oulu, Finland. <http://urn.fi/URN:NBN:fi:oulu-202307272903>

Wang, Y., Sarkis, J. 2021. Emerging digitalisation technologies in freight transport and logistics: Current trends and future directions, Transportation Research Part E: Logistics and Transportation Review, Volume 148, 2021, <https://doi.org/10.1016/j.tre.2021.102291>

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