



# RETAILL

An AI-driven platform to improve sustainability, reduce food waste and optimise supply chain operations

By leveraging existing IoT and supply chain data through advanced AI, the ITEA project RETAILL (REtail using Technology based on Artificial InteLLigence) aims to reduce food waste, optimise operations, and enhance sustainability and profitability across the food value chain. This will include a digital twin/simulator of the food supply chain, capable of modelling, analysing and optimising the flow of products from producers to consumers under dynamic real-world conditions.

### Addressing the challenge

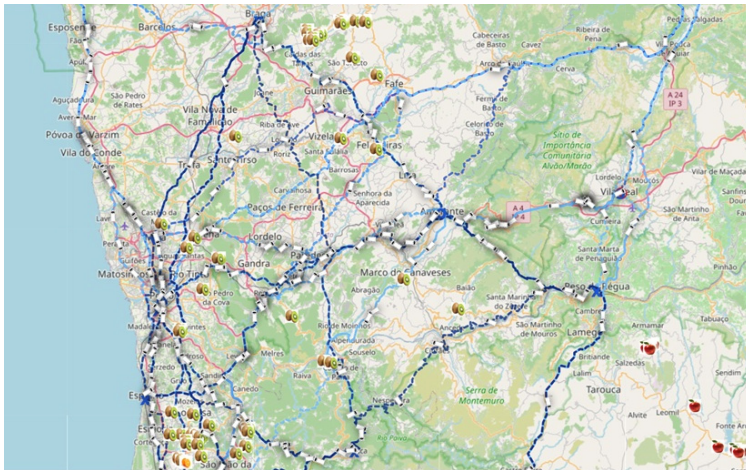
17% of the world's food production was wasted in 2019, with 8-10% of global greenhouse gas emissions associated with unconsumed food. The retail sector is responsible for around 13% of this food waste, largely related to overproduction and to transportation, storage, and display practices. This is a major obstacle to the UN's Sustainable Development Goal (SDG) of halving food losses along production and supply chains by 2030.

### Proposed solutions

To directly address SDG 12 (Sustainable Food Production and Consumption), RETAILL will develop a platform designed as a modular, AI-driven decision-support ecosystem with a set of specialised intelligent agents. Leveraging IoT, logistics and supply chain data, these agents will collaboratively transform data into actionable insights to improve operational efficiency, sustainability and product quality. A central component of the platform is a digital twin/simulator of the agri-food supply chain, used to simulate transportation, storage, product quality losses and demand conditions. This will support smarter and more adaptive decisions, particularly optimised routes and logistics plans from producers to consumers. For example, routing agents will exploit the digital twin to evaluate transport plans by considering shelf life, perishability, delivery constraints and real-time operational

conditions. In parallel, lifecycle assessment and multicriteria decision-support components will help quantify environmental impacts and support balanced trade-offs across operational,

also improve route planning and logistics efficiency, reducing fuel usage, emissions and unnecessary product spoilage. These advances will support the broader goal of greater sustainability along the food chain, with RETAILL quantifying and assessing improvements in energy use, CO2 emissions, and material and water consumption. Economically, the consortium will exploit either the full solution or individual modules tailored to their national and sectorial challenges, targeting producers, retailers, logistics companies and process industries



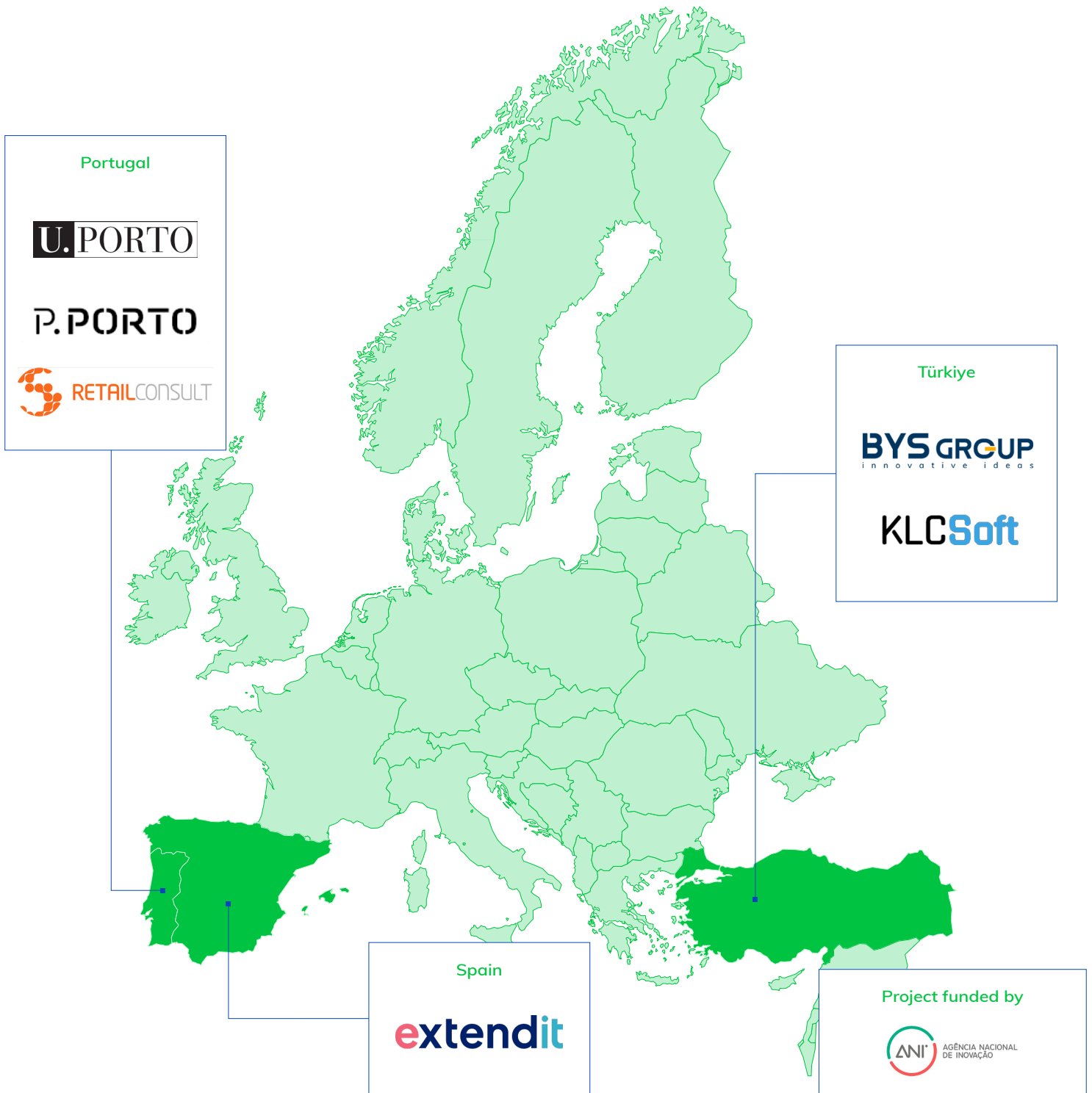
◀ RETAILL digital twin enabling smarter, data-driven supply chain decisions.

economic and sustainability dimensions. By integrating these capabilities, RETAILL enables coordinated, data-driven decision-making across stakeholders.

### Projected results and impact

Environmentally, the project aims to significantly reduce food waste and environmental impact across the supply chain, including decreasing fruit losses from ~20% to 15% in post-harvest and storage stages and reducing retail food waste to ≤5%. Through the digital twin and optimisation modules, the project will

with cost savings in waste reduction, transportation and resource use. Socially, consumers will gain access to higher-quality products, while the project will strengthen the revenue and bargaining power of smaller participants, such as producers and retailers in low-income territories, by creating a more transparent, intelligent and connected value chain. In the longer term, RETAILL will promote fairer remuneration models for producers, increasingly aligned with the quality and sustainability of their production practices.



**Project start**  
July 2024

**Project leader**  
Matilde Rodrigues, P.PORTO

**Project website**  
<https://itea4.org/project/retail.html>

**Project end**  
June 2027

**Project email**  
mar@ess.ipp.pt



ITEA is the Eureka RD&I Cluster on software innovation, enabling a large international community of large industry, SMEs, start-ups, academia and customer organisations, to collaborate in funded projects that turn innovative ideas into new businesses, jobs, economic growth and benefits for society. ITEA is part of the Eureka Clusters Programme (ECP).

<https://itea4.org>