

ACTION SUMMARY REPORT

Phase 1

This document constitutes part of Work Package 2, specifically Deliverable 2.1.1, within the implementation framework of the D4PACK project under the Interreg Central Europe programme.

The report reflects progress achieved in relation to Activity 2.2, aimed at testing a transnational collaborative environment enabling accelerated transition toward sustainable packaging solutions through a structured and holistic Technology Transfer Service model.

1. Executive Summary

Phase 1 of the Pilot Action, conducted between June and October 2025, represents a foundational step in validating the methodological assumptions of the D4PACK project and testing the operational feasibility of a collaborative framework supporting packaging transition in the agri-food sector.

The implementation of pilot actions across **thirteen companies** operating within the **meat, dairy, and fruit & vegetable** categories in **Hungary, Slovenia, Czech Republic, and Italy** demonstrated a high degree of readiness, willingness, and strategic awareness related to sustainability-driven packaging transformation. Despite limited organizational resources and financial constraints typical of small and medium-sized enterprises, participants showed strong commitment to alignment with European policy frameworks, scientific guidance, and emerging market expectations.

Results collected in this phase confirm that a coordinated, structured, and cross-border knowledge exchange platform can substantially increase the efficiency and speed of decision-making processes associated with packaging innovation. The collaborative nature of the initiative enabled SMEs to express real needs, constraints, and expectations based on operational reality rather than theoretical assumptions, making the acquired insights highly applicable and action-oriented.

2. Scope & Context

The primary objective of Phase 1 was the practical piloting of the D4PACK Technology Transfer Service (TTS) model, designed to support SMEs in efficiently navigating the technical, regulatory, and economic complexities associated with the transition toward sustainable packaging.

Pilot actions were structured as three-hour sessions consisting of:

1. **Technical and functional assessment** of packaging performance requirements, limitations, and development ambitions.
2. **Risk assessment and feasibility analysis** with the support of PwC experts, focusing on financial implications, operational impacts, regulatory obstacles, and market dependencies.

The pilot environment served as a transnational and multidisciplinary collaboration space, where SMEs could openly share experiences and explore structured transition pathways in alignment with the goals of the European Green Deal, Circular Economy Action Plan and emerging packaging regulatory frameworks.

Pilot actions were conducted with thirteen SMEs, representing diverse production profiles and levels of technological readiness, thereby providing a comprehensive overview of sector-wide barriers and opportunities.

3. Key Insights from Phase 1

A strong convergence of attitudes was observed across participating companies, regardless of national context or product category. SMEs expressed a clear strategic direction toward sustainable packaging development, supported by proactive rather than reactive thinking.

Across all participants, the following ambitions repeatedly emerged:

- Reduction of plastic use and transition toward mono-material and recyclable structures;
- Increased application of renewable raw materials and bio-based coating technologies;
- Packaging optimisation aimed at material efficiency and weight reduction;
- Alignment with retailer requirements and evolving consumer expectations driven by environmental consciousness.

Many companies demonstrated developed conceptual alternatives or early-stage prototyping activities and used the pilot actions primarily as an opportunity to validate assumptions, benchmark feasibility, and understand risks associated with implementation.

4. Common Challenges Reported by SMEs

Although motivated, SMEs consistently highlighted several systemic barriers limiting packaging transition progress:

Challenge	Description
Limited financial capacity	High cost of investment in new machinery, packaging materials, and certification, combined with uncertainty regarding return on investment
Insufficient internal resources	Lack of dedicated staff specialising in packaging technology or sustainability strategy
Complex regulatory environment	Ambiguity linked to dynamically evolving EU legislation, including plastic taxation, EPR frameworks, and national compliance variations
Food safety and product integrity	Non-negotiable priority restricting experimentation with novel materials without validated evidence
Retailer compliance pressures	Extensive packaging guidelines imposed by large retail networks limit innovation freedom
Brand and visual identity requirements	Market competitiveness dependent on perception and retail shelf aesthetics

These constraints highlight the urgent need for structured support, risk mitigation tools, and collaborative platforms enabling transparent knowledge-driven decisions.

5. Recommendations

Based on aggregated findings from Phase 1, the following recommendations are proposed:

- Establish accessible and structured decision-support tools enabling holistic multi-criteria evaluation of potential packaging alternatives.
- Improve access to validated knowledge, technical expertise, and commercial readiness assessments.
- Strengthen cross-border cooperation and harmonised communication frameworks between supply-chain stakeholders.

6. Next Steps

Phase 2 will focus on:

- development and validation of alternative packaging proposals based on real operational constraints,
- preparation of feasibility assessments for selected solutions,
- refinement of the algorithm supporting decision-making processes,
- coordinated evaluation of implementation steps together with industry stakeholders.

7. Note on Algorithm Development

The algorithm currently under development acts as a complementary tool supporting SMEs in screening and prioritising packaging alternatives based on technical, environmental and functional requirements. It is designed to enhance transparency and consistency of decision-making processes rather than replacing technical judgement or limiting innovation possibilities. Insights from pilot actions will be integrated into its refinement to increase usability and real-world applicability.

This summary report is based solely on existing qualitative insights generated during Phase 1 pilot actions. The document will be expanded after participating companies receive their individual pilot reports, select the preferred packaging alternative for implementation, and provide consolidated feedback on feasibility, risk and expected impact.