The Curtain Falls on SUSTRACK: Paving the Way for Europe's Circular Bio-based Future

3RD NEWSLETTER

Funded by the European Commission as a Coordination and Support Action (CSA) and led by the UnitelmaSapienza University of Rome, the three-year SUSTRACK project aimed at supporting the identification of policy priorities and recommendations for designing a sustainable track towards circular bio-based systems, and has now reached its end. Throughout its lifetime, SUSTRACK has brought together more than **700 stakeholders**, organised over **15 events** and **5 capacity-building activities**, and collected insights through **three surveys** focusing on four high-impact sectors: **chemical, construction, plastics, and textile**.
Discover the final results achieved and the exploitable assets available!

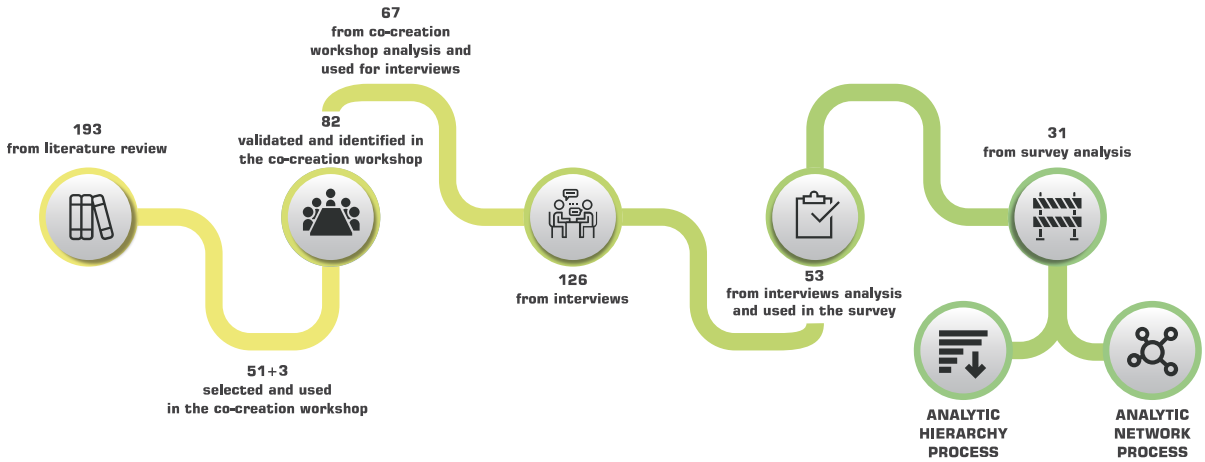
Identifying and Prioritising Barriers to the Circular Bio-based Transition

SUSTRACK began its journey by mapping the **barriers that prevent the shift from a linear fossil-based economy to a circular bio-based one**.
Through an extensive **grey and white literature review**, the project identified **193 distinct barriers** across the **chemicals, construction, plastics, and textile sectors**. These barriers were grouped into **six main clusters** — *economic, governance, environmental, technical, cultural, and structural.*

To complement the literature review, SUSTRACK engaged stakeholders through **focus groups, interviews, and a survey**, leading to the validation of **31 key barriers**. This participatory process revealed that achieving the circular bio-based transition requires **deep governance and structural changes** to reshape the current economic model.

Finally, using **multi-criteria decision analysis (MCDA)** — combining the **Analytical Hierarchy Process (AHP)** and the **Analytical Network Process (ANP)** — SUSTRACK prioritised barriers and explored their interconnections.

Main barriers identified per cluster are investment, financial practices and cost competitiveness of biobased products (Economic); competing political interests with fossil-based industries and the lack of coherence between policies (Governance); the need for enhanced knowledge, standardised methodologies and sustainable management (Environmental); lack of recycling capacity, insufficient technology, development, low quality and amount of recyclable materials (Technical); consumers 'confusion and lack of trust due to unclear sustainability claims and/or misinformation related to the circular bio-based products (Cultural) and the lack of collaboration between value chain actors and the lack of established markets for by-products (Structural).
Results showed that **economic** and **governance** barriers are the most critical to address, while **competing political interests, regulatory fragmentation**, and **social and technical lock-ins** emerged as the **most influential barriers overall**.
Explore the full analysis!



Monitoring Progress in the Circular Bio-based Transition

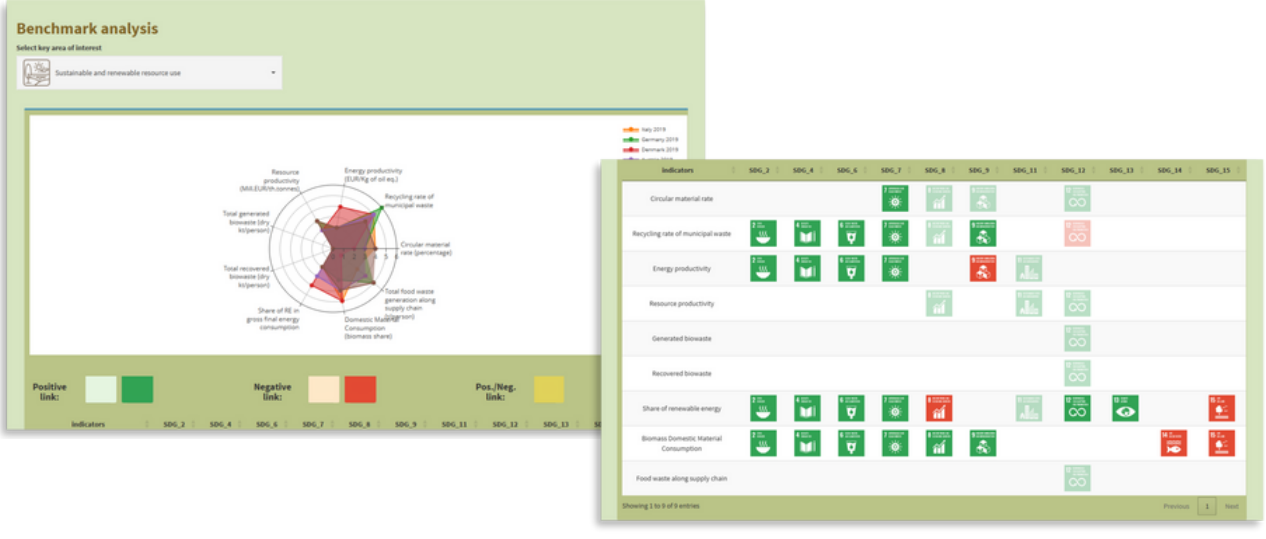
To track Europe's progress towards a circular bio-based economy, SUSTRACK developed a **comprehensive monitoring system and digital tool** that combine research evidence, indicator assessment, and stakeholder insights.
Starting from an in-depth review of existing monitoring systems, existing indicators were screened and refined through a SMART-based prioritisation process, resulting in a **curated set of indicators structured into three thematic areas: environmental performance, economic competitiveness and jobs, and sustainable resource use**. Each indicator was normalised into a scoring system from 1 to 6, enabling cross-country comparisons over time.

The outcome is an **interactive online tool that allows users to benchmark EU countries, visualise trends, and identify hotspots where policy attention is most needed**.
Results from the analysis revealed an uneven bioeconomy transition across Europe:

- Belgium and the Netherlands show balanced progress across all dimensions.
- Spain and Italy stand out for environmental achievements but face competitiveness challenges.
- Bulgaria and Romania display strong bio-based activity but weaker results in resource management.

These variations are not shortcomings but signals of where targeted policy efforts could drive convergence.
By linking indicators to the Sustainable Development Goals (SDGs), **the system also highlights trade-offs and synergies between different sustainability dimensions, helping policymakers move beyond one-directional interpretations**.

Looking ahead, the SUSTRACK monitoring tool offers high potential for replication and uptake. With its user-friendly visual interface, it can support countries developing their first bioeconomy strategies and inspire future enhancements of the EU Bioeconomy Monitoring System (EU-BMS), particularly through its benchmarking and SDG-linking functionalities.
Discover the tool and full methodology!



From fossil to bio-based chains: Case Studies and Policy Pathways for the Circular Bio-based Transition

To ensure that methodologies and tools developed within SUSTRACK were grounded in real-world contexts, the project adopted a **bottom-up case study approach**.
A total of **11 case studies across Europe** were selected to **test, validate, and refine** SUSTRACK's key outputs - while also **collecting policy priorities and scenarios** through stakeholder interaction.

Each case study represents a **specific value chain or product system** within the chemicals, construction, plastics, and textiles sectors.

Sector	Case Study
 Chemical sector	• Methanol from waste • Bio-MEG from wood
 Textile sector	• Man-made cellulosic fibre (Lyocell) • Recycled carded wool from Prato, Italy • Latxa sheep wool from the Basque Country of Spain
 Plastic Sector	• Polylactic acid (PLA) • Polypropylene from used cooking oil • Cellulose acetate
 Construction sector	• Cross-laminated timer • Biochar as an additive in concrete • Hemp insulation

They were analysed through a common framework covering:

- Biomass conversion processes and market characteristics
- Stakeholder mapping (power–interest influence on the transition)
- Relevant policies acting as barriers or enablers
- Key environmental, economic, and social indicators to assess circularity and sustainability

The consolidated analysis revealed **recurring challenges** that hinder the transition from fossil-based to circular bio-based systems:

Market barriers – Bio-based and circular products often face **higher costs**, limited economies of scale, and **insufficient market pull** due to the lack of incentives and monetisation of environmental benefits. Secure and sufficient availability of bio-based raw materials is complex, and costs are often relatively high.

Sustainability perception barriers – Persistent **knowledge gaps and misconceptions** about the durability and sustainability of bio-based materials limit consumer acceptance and market uptake.

Policy and governance barriers – Existing **regulations and standards** still favour fossil-based materials, with limited adaptation to the unique properties of bio-based and recycled alternatives. There is still limited policy stimulation given to recyclability, lowering footprints and prevention of non-biodegradable losses to the environment, and no mechanisms are yet in place to prevent green washing, unfounded circularity and sustainability claims.

From these findings, SUSTRACK formulated **cross-cutting policy recommendations** to address structural barriers and stimulate the bio-based transition.

Among them:

- **Tax incentives** (e.g. reduced VAT for recycled or bio-based products) and **penalties** for fossil-based materials, aligned with the **Carbon Border Adjustment Mechanism (CBAM)**.
- Introduction of **quota systems** for recycled and bio-based materials, calibrated to their availability and quality.
- Use of **Digital Product Passports (DPPs)** and **Environmental Product Declarations (EPDs)** to enhance transparency and harmonise standards across Europe.
- Continued **policy and financial support for R&D**, market entry, and awareness-raising initiatives to strengthen innovation and public trust.

These insights form the foundation for SUSTRACK's **sectoral policy roadmaps** and **transition pathways**, offering practical guidance for policymakers to design coherent strategies that balance competitiveness, sustainability, and societal acceptance.

Explore the case studies!

Scenarios and Modelling for a Sustainable Bio-based Future

To guide the transition toward a circular bio-based economy (CBBE), SUSTRACK used a **baseline scenario Business as Usual (BAU)** and developed two **forward-looking policy pathways**

BioTransition and

BioRevolution

designed to represent different levels of policy ambition and tested through the Green Economy Model (GEM).

The scenarios were **built through a structured five-step process**, combining evidence, policy mapping, and stakeholder input. After defining objectives and focus countries (Germany, the Netherlands, and Italy), the team reviewed EU and national policies, extracted quantitative and qualitative targets, and validated assumptions through expert consultations. These elements were then integrated into two coherent, data-driven transition scenarios forming the basis for GEM simulations.

At the heart of this analysis lies **GEM, a systems-based tool built using System Dynamics and GIS integration**. GEM allows users to model complex interactions between social, economic, and environmental variables from 2005 to 2050, performing “what-if” and cost-benefit analyses to evaluate long-term sustainability impacts across sectors and policy options.

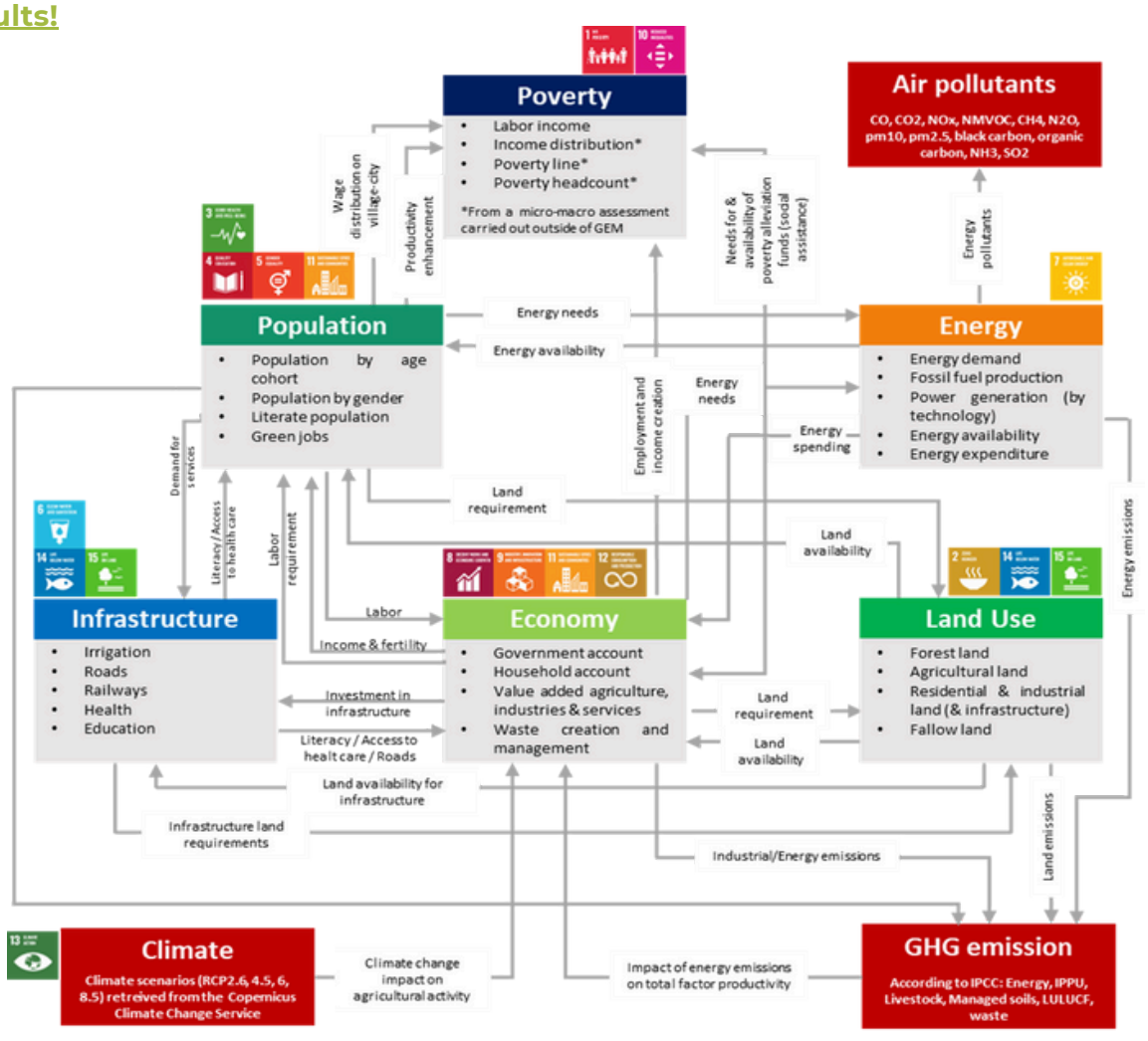
Using GEM, SUSTRACK explored how industries can transform under the BioTransition and BioRevolution pathways, revealing key insights for policymakers:

Higher Value Addition from CBBE
Bio-based products generate greater economic value and lower negative externalities compared to business-as-usual. Even when consumption decreases through efficiency or longer product lifetimes, the bio-based industry shows a net positive economic impact.

Sustainable Biomass Demand
Increased biomass demand can be met sustainably by using marginal and abandoned land, protecting forests and productive farmland. In Germany, the Netherlands, and Italy, only one-third to one-half of such land would suffice, with additional benefits for soil health, carbon sequestration, and biodiversity.

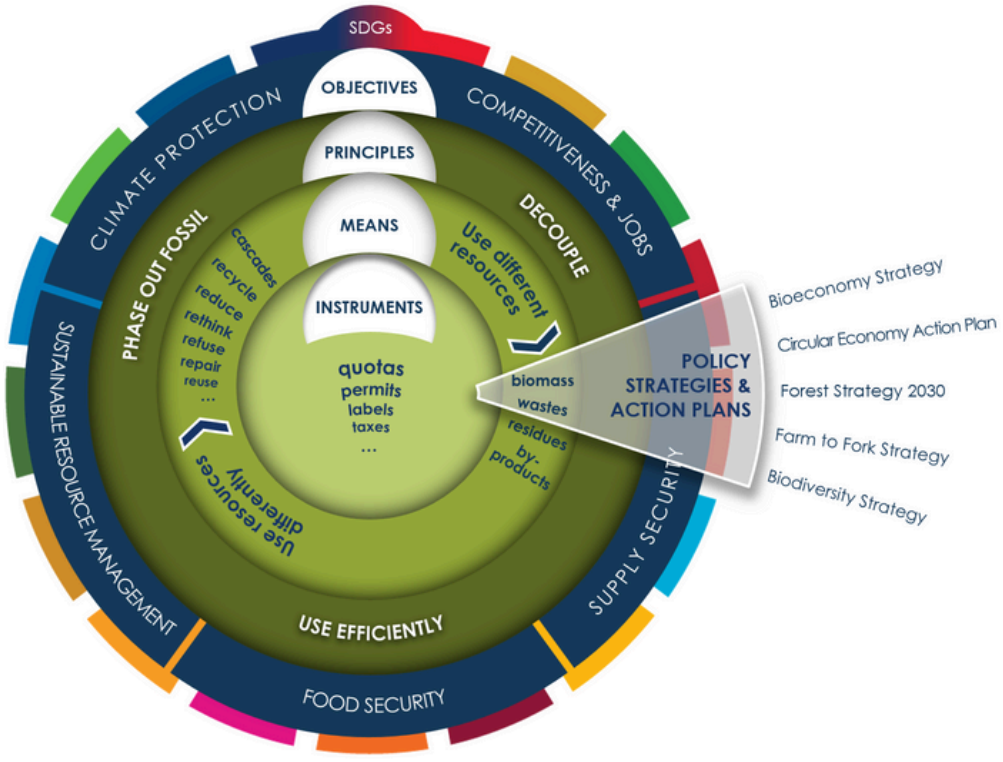
Trade-offs and Policy Implications
The transition must balance land use, environmental safeguards, and economic restructuring. Complementary policies — such as promoting wood-based construction or sustainable land management — are critical to preserve jobs, ecosystems, and fair competition while avoiding indirect land-use change.

Overall, the **GEM simulations confirm that the bio-based transition can deliver tangible economic and environmental gains, provided that policies are well-coordinated, socially inclusive, and backed by clear sustainability safeguards**.
Discover the BioTransition and BioRevolution scenarios and explore GEM results!



Policy Options and Roadmaps for the Circular Bio-based Transition

Building on the analytical, modelling, and stakeholder work, **SUSTRACK identified policy options and roadmaps to support the European transition toward a circular bio-based economy (CBBE)**.
The work was grounded in the understanding that biomass use and circularity are key levers to achieve complex sustainability goals — and that effective policy design must carefully balance environmental ambition, economic feasibility, and societal acceptance. The analysis combined literature review, stakeholder dialogues, and a survey to identify, validate, and prioritise relevant policy instruments for the four focus sectors — chemical, construction, plastics, and textiles.



For each sector, **SUSTRACK prepared policy factsheets with exemplary solutions and sectoral roadmaps detailing actionable recommendations.**
Key insights emerged on how to effectively combine different types of policy instruments:

Smart Mix of Market-based and Regulatory Tools
Policymakers should assess when market-based measures (e.g. carbon pricing, tradable permits, targeted taxes) are more efficient, and when direct regulation (e.g. quotas, bans, sustainability criteria) provides necessary guidance.
Market-based policies can reduce administrative costs, while regulatory ones should be coupled with innovation support to ensure that sustainable alternatives are available and competitive.

Revenue Recycling and Acceptance
Pricing instruments are preferable to subsidies, as they minimise rebound effects. Revenues should be recycled back to businesses and consumers to enhance acceptance and facilitate adaptation to new market conditions.

Innovation and Sustainability Criteria
Policies fostering R&D and innovation, together with clear sustainability standards for biomass use, are essential to accelerate the uptake of non-fossil feedstocks. Sectoral differentiation is key: quotas may work best for plastics and chemicals, while carbon pricing could be more effective in textiles and construction.

Monitoring Economic and Social Impacts
Since the transition can affect growth and employment in the short term, macroeconomic policies, such as temporary public spending or strategic marketing initiatives, can help mitigate potential disruptions and support re-skilling and job creation.

Sustainable Biomass Use and Land Efficiency
To address the increasing demand for biomass, priority areas for production should be identified where both economic and ecological value are low, ensuring win-win outcomes for the environment and industry. Improving land use efficiency remains crucial to avoid competition between uses and to reinforce sustainability safeguards.

Together, these policy pathways form a coherent framework for guiding the CBBE transition — one that combines regulatory clarity, market incentives, and innovation support to ensure an inclusive and effective European transformation.
Explore policy factsheets and sectoral roadmaps!

DEPLOY Conferences: From European Vision to National Action

As a key part of its stakeholder engagement activities, SUSTRACK organised a series of **national deployment workshops under the common title: "Planting the Seeds of Systemic Change – Empowering Stakeholders and Shaping Policy Across EU Countries for a Sustainable Circular Bio-Based Economy."** Held in **Italy, Germany, Slovakia, the Netherlands, and Belgium**, these workshops marked the final phase of stakeholder engagement, translating **SUSTRACK's research and tools into actionable insights for national and regional actors**. Each event was tailored to the country context, linking European strategies with national implementation pathways, and targeting policymakers, industry professionals, researchers, and sustainability actors in the four focus sectors: textile, chemical, construction, and plastics.

Across the series, **112 external participants** engaged in a combination of keynote sessions, presentations of SUSTRACK policy instruments, and sectoral group discussions. Stakeholders assessed the strengths and weaknesses of different instruments, distinguishing between direct regulation and market-based policies, and prioritised the most promising tools for each sector.

To complement the workshops, a **survey was conducted in Spain** focusing on the **plastics and textile sectors**, gathering additional insights from national stakeholders to enrich the outcomes.

Main lessons and patterns across countries:

- **Regulatory instruments as central drivers**: Binding measures such as recycled/bio-based content quotas, ecodesign standards, and sustainability criteria were consistently valued for long-term investment certainty and innovation stimulation.
- **Skepticism towards taxation, but support for subsidies**: Market-based fiscal measures (e.g., virgin material taxes or carbon pricing) raised concerns about competitiveness and administrative complexity, while subsidies and targeted financial incentives were seen as essential enablers.
- **Enforcement capacity matters**: Ambitious policies require robust monitoring, reporting, and administrative resources to be effective.
- **Acceptance and political sensitivity**: Success depends on both public and political support, particularly for measures affecting consumer behaviour or SMEs.

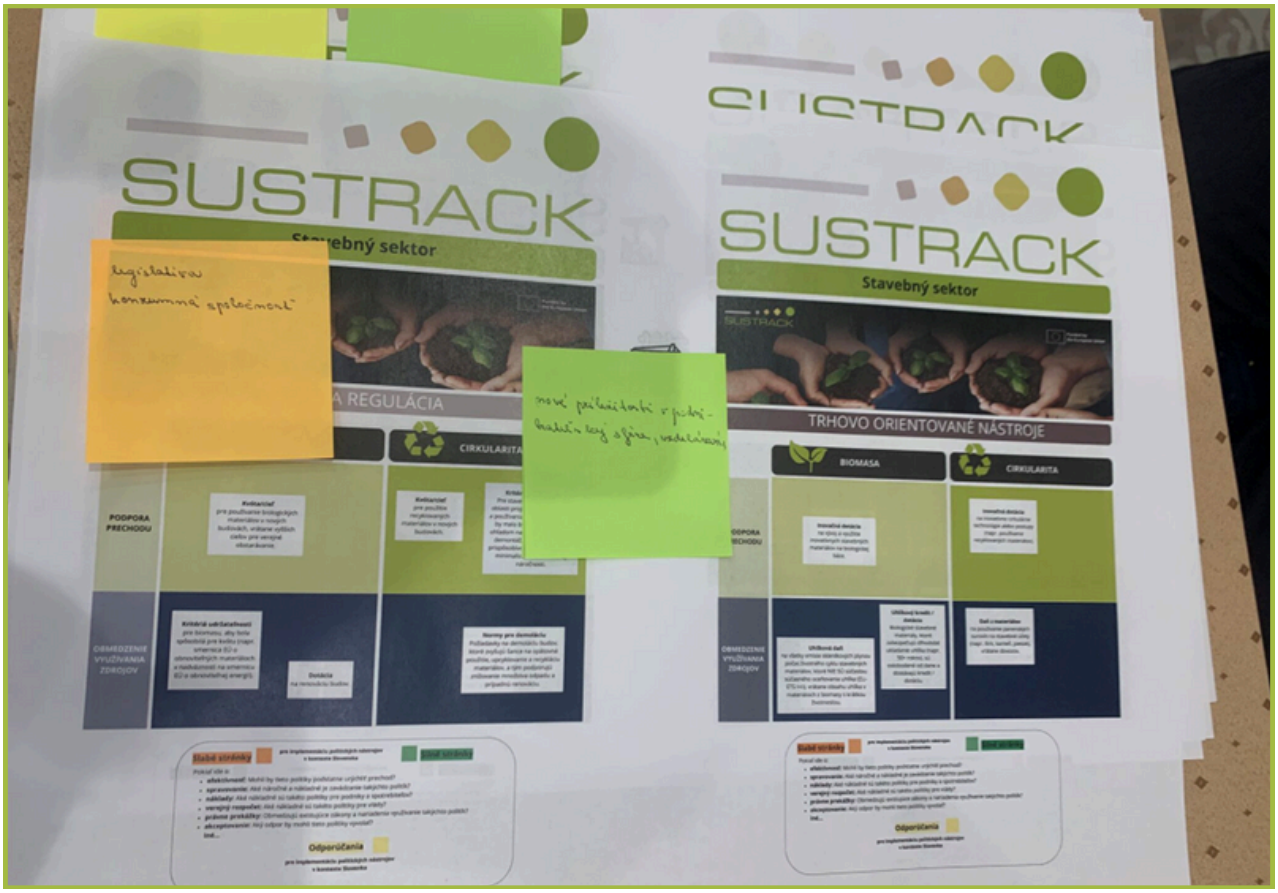
Sector-specific highlights:

Construction (Slovakia; Netherlands–Belgium): Standards for reused and bio-based materials, material passports, and refurbishment incentives were key; readiness varied across countries.

Chemical (Germany; Netherlands–Belgium): Feedstock diversification and sustainability criteria emerged as central; quotas and innovation subsidies were highlighted differently depending on national context.

Textile (Italy; Slovakia; Spain): Ecodesign standards for durability, reparability, and recyclability were prioritised, with differing perceptions of feasibility and cost.

Plastics (Germany; Italy; Spain): Recycled content quotas were consistently prioritised; infrastructure and capacity gaps influenced readiness.



The workshops concluded with a plenary session focusing on capacity building and knowledge transfer, presenting key SUSTRACK tools: the Monitoring System, Systems Thinking & Causal Loop Diagrams, and the Green Economy Model (GEM) — all designed to support informed decision-making and systemic transformation.
Learn more about the DEPLOY conferences, access results, capacity-building materials, and videos!