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BIOECO-UP

STRATEGY AND ACTION PLAN FOR BIOECONOMY MEASURES

GLOSSARY

AKIS	Agricultural Knowledge and Innovation Systems
BIOEAST	Central and Eastern European Initiative for Knowledge-based Agriculture, Aquaculture and Forestry in the Bioeconomy
LAG	Local Action Group
LIFE	The LIFE programme is the EU's funding instrument for the environment and climate action
CLLD	Community-Led Local Development
CO_2	Carbon Dioxide
EAFRD	European Agricultural Fund for Rural Development
EIP-AGRI	European Innovation Partnership for Agricultural Productivity and Sustainability
R&I	Research and Innovation
ERDF	European Regional Development Fund
SME	Small and Medium-sized Enterprise
GHG	Greenhouse Gas
SWOT/TOWS	Strengths, Weaknesses, Opportunities, Threats / And reverse
GIS	Geographic Information System
CAP Pillar I	Direct Payments and Market Measures under the Common Agricultural Policy
CAP Pillar II	Rural Development Measures under the Common Agricultural Policy
EIP	European Innovation Partnership

CONTENT

INTRODUCTION AND SCOPE OF THE TASK

Central Europe stands at a decisive moment in the EU's green and digital transitions. Across the BIOEAST macro-region, agriculture, forestry and rural territories combine strong biomass potential and growing innovation capacity with persistent structural bottlenecks—fragmented governance, uneven advisory coverage, limited infrastructure for bio-based value chains, and administrative complexity that can slow down innovation and uptake. Within this context, the Common Agricultural Policy (CAP) remains the most influential policy lever for "mainstreaming" circular bioeconomy objectives: it shapes incentives at farm level (eco-schemes), enables structural change through investments, and channels knowledge and cooperation through AKIS, EIP-AGRI and local development instruments.

This document presents **the Central European Bioeconomy Strategy (strategic orientation) and Action Plan** as a coherent, evidence-based framework for integrating circular bioeconomy measures into CAP programming and related national policies in six partner countries—Czechia, Croatia, Hungary, Poland, Slovakia and Slovenia. It is designed not only to "recommend" measures, but to provide a practical intervention logic: how priorities translate into CAP-relevant instruments, how measures can be sequenced over time, and how governance and knowledge systems can enable implementation at scale.

The Strategy and Action Plan was developed through a structured methodology that combines desk research, national and transnational expert consultation, and strategic design tools. Partner countries conducted harmonised **desk reviews** of national policy contexts, CAP governance and instruments under both Pillars, policy gaps and barriers, and transferable best practices. This analytical foundation was complemented by **Delphi Group consultations** engaging quadruple-helix stakeholders (policy, research/education, business and civil society), enabling expert validation of priorities and identification of feasibility constraints and enabling conditions. **Strategic orientation** was then constructed through multi-criteria approaches—key enabling technologies, transformation pathways, prioritisation matrices, and structured drivers-and-barriers analysis (PESTEL/TIS), complemented by SWOT/TOWS strategic action building and, where relevant, optional social network analysis insights on governance dynamics.

Figure 1. Methodology of desigining the CE Bioeconomy Strategy and Action Plan

A core conclusion emerging from the strategic orientation is that, while the CAP provides a common and increasingly performance-based framework, effectiveness depends on national governance capacity, monitoring systems and advisory support. The CAP instrument mix is functionally converging—eco-schemes as the mainstreaming lever, Pillar II investments as the engine for structural transformation, and AKIS/cooperation mechanisms as the bridge from innovation to practice—yet the bioeconomy often remains indirect or weakly embedded. The Strategy therefore emphasises a shift from fragmented, sector-by-sector approaches to integrated bioeconomy governance, linking bioenergy, regenerative and precision agriculture, and bioprocessing/biomaterials into mutually reinforcing value chains, supported by measurable indicators and stronger policy coherence.

The Action Plan operationalises this strategic logic through **six interlinked areas of interest: (1) Governance & AKIS, (2) Research, Innovation & Digitalisation, (3) Climate & Environmental Sustainability, (4) Sustainable Agriculture, Food & Forestry Value Chains, (5) Rural Communities & Regional Bioeconomy Hubs, and (6) Knowledge & Skills for Farmers and Advisors.**

Together, these areas reflect the document's guiding principles, including sustainability and climate neutrality; "food first" and nutritional security; innovation, digitalisation and evidence-based policy; good governance and adaptive cooperation; cascading and circular resource use; local empowerment through regional hubs; and investments in human capital, skills and lifelong learning.

For usability in policy design and programming, the Action Plan presents **a selected set of measures** (drawn from a larger portfolio referenced in the document) organised by country relevance and implementation time horizons—short-term actions deliverable within the current CAP cycle through adjustments, pilots and targeted support; mid-term actions requiring deeper coordination, capacity-building and regulatory alignment; and long-term actions representing structural transformation aligned with the post-2027 CAP framework. This structure is meant to support national-level discussion, identify transnational synergies, and accelerate coordinated uptake across the BIOEAST macro-region.

Finally, the document positions uptake as an active policy process rather than a one-off dissemination exercise. It proposes institutional anchoring through structured dialogue with ministries and BIOEAST governance bodies, transnational peer learning and thematic clusters, knowledge brokerage through AKIS and BIOEAST hubs, targeted communication and capacity-building, and piloting with feedback loops that allow measures and indicators to be refined through "learning-by-doing." In parallel, the future-oriented framing highlights how upcoming CAP reform dynamics and longer-term EU strategic directions create favourable conditions for embedding circular bioeconomy measures—such as carbon farming, nutrient circularity, bio-based value chains and innovation ecosystems—within mainstream agricultural policy and the next programming period (2028–2034).

STRATEGY: METHODOLOGICAL NOTE FOR STRATEGIC ORIENTATION

The Central European Bioeconomy Strategy and Action Plan was developed through a structured methodology combining:

1. Desk research – mapping national policies, CAP instruments, and bioeconomy-relevant practices.
2. Delphi Group consultations – gathering expert judgments through structured questionnaires and group discussion.
3. Strategic design – identifying enabling technologies, transformation pathways, drivers/barriers, and strategic priorities.

An optional Social Network Analysis (SNA) explored governance dynamics and stakeholder interactions in selected domains.

The approach ensured evidence-based, expert-validated, and forward-looking strategic outputs tailored to national contexts.

Desk Research

All partner countries (Czechia, Croatia, Hungary, Poland, Slovakia, Slovenia) conducted desk reviews using a **harmonised template**. Each analysis included: (1) National policy and institutional context for bioeconomy, (2) CAP governance and relevant measures under both Pillars, (3) Instruments supporting circular and bio-based solutions, (4) Policy gaps, opportunities, and barriers, (5) Examples of best practices and transferable solutions.

Sources included CAP Strategic Plans, national strategies, legislation, statistics, and scientific literature. Outputs formed the **analytical foundation** for the Strategy and Action Plan and built on findings from previous report/deliverable „Policy analysis of circular bioeconomy measures“.

Delphi Group Consultations

Delphi workshops were organised in each participating country and involved **quadruple-helix stakeholders** (policy, research/education, business, civil society). Experts represented diverse fields including biogas, agroecology, digital agriculture, biomaterials, biodiversity, and bio-based value chains.

The method combined:

- Individual scoring of statements (usually 1–10 scale);
- Aggregation and presentation of results;
- Plenary discussion to clarify disagreements and share evidence;
- (In some cases) a second reflective round.

Outputs included quantitative ratings and qualitative insights, which were synthesised into a transnational review. The process strengthened shared understanding of challenges and opportunities in CAP-related bioeconomy development.

Strategic Orientation Development

The final methodological stage translated analytical and expert inputs into **strategic proposals** through:

- Identification of **Key Enabling Technologies (KETs)** for bioeconomy transition;

- Construction of **transformation pathways**;
- Prioritisation of measures using **impact-effort** and **policy support-profit** matrices;
- Assessment of **drivers and barriers** (PESTEL / TIS);
- Development of **SWOT-TOWS-based strategic actions**;
- Optional **SNA-based governance insights**.

Identification of Key Enabling Technologies (KETs)

Experts listed characteristics and technology fields critical for bioeconomy transformation (e.g., enzyme technologies, precision farming, biorefining, synthetic biology, bioinformatics). Technologies were linked to five transformation pathways:

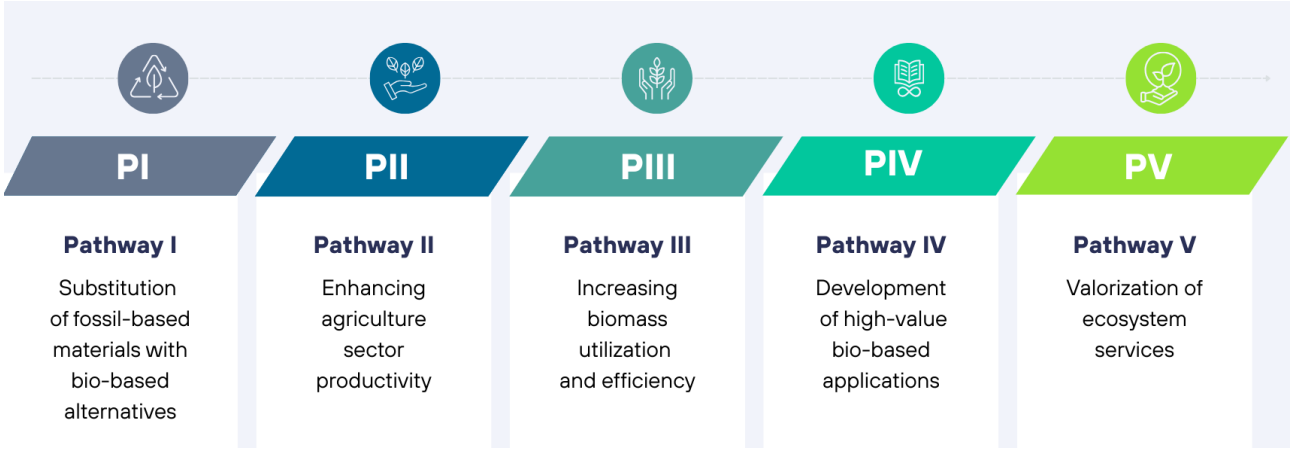

Figure 2. Transformation pathways

A consolidated frequency analysis (example provided in the full note) highlights dominant areas such as enzyme technologies, precision agriculture, bioinformatics, algae technologies, biogas/biomethane solutions, and biorefineries.

Prioritisation Through Matrices

Each KET was assessed using:

1. Impact-Effort Matrix (action priority)
    - High-impact/low-effort: short-term priorities
    - High-impact/high-effort: strategic long-term projects
    - Low-impact/low-effort: supporting measures
    - Low-impact/high-effort: lower priority unless synergistic
2. Policy Support-Profit Matrix (sustainability)
    - Identifies whether technologies require public funding, are market-ready, or currently under-supported.

Combining both matrices allowed ranking of technologies based on feasibility, economic potential, and policy relevance. Examples include biogas-related business models, cascading biomass use, logistics/post-harvest systems, and precision/digital agriculture.

Social Network Analysis Component (Optional)

Some partners examined stakeholder structures (e.g., in biogas projects). Early findings highlight:

- Dense local networks and strong intermediary actors support cooperation and governance;
- Trust and geographical proximity enable access to feedstock and conflict mitigation;
- Multi-actor governance requires inclusive participation of farmers, municipalities, industry, and citizens.

Drivers and Barriers (PESTEL/TIS/Foresight)

Drivers and barriers for each pathway or technology were classified using **PESTEL**, Technology Innovation Systems (TIS), and foresight dimensions (supply chains, markets, policy expectations, societal acceptance).

Typical categories included:

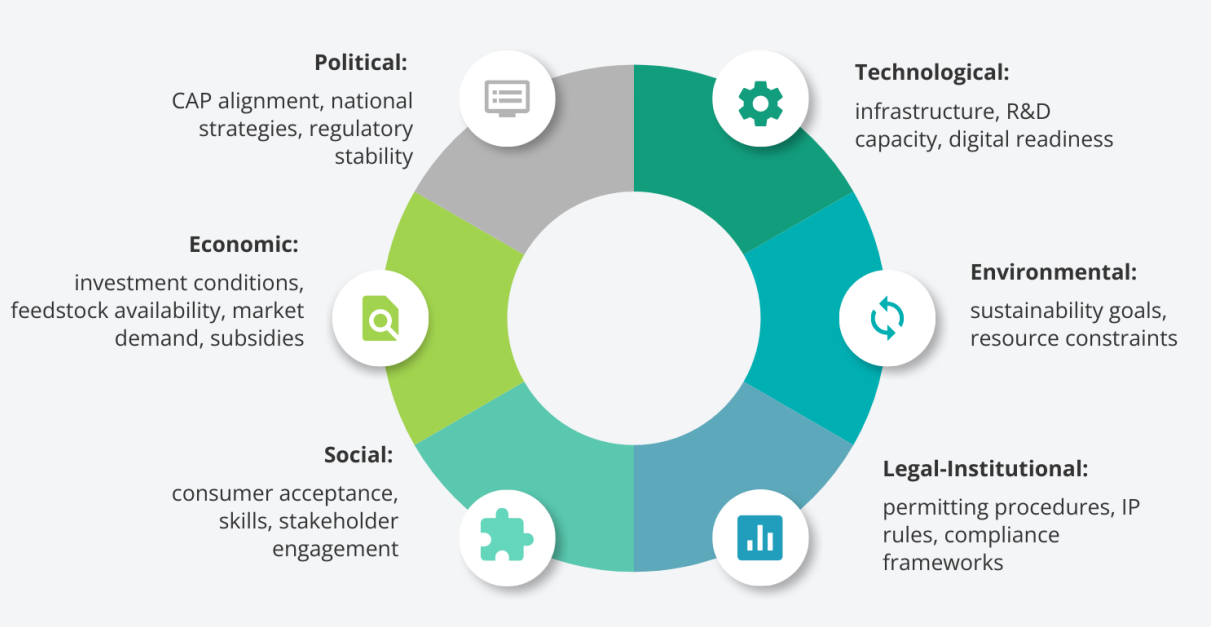

Figure 3. PESTEL analysis factors

This classification provided input for SWOT analysis.

SWOT and TOWS Analysis

Using the PESTEL/TIS insights, each pathway or KET was evaluated through:

- Strengths (e.g., maturity of technology, local feedstock availability, potential for positive externalities)
- Weaknesses (e.g., high capital costs, technical constraints, lack of skills, community concerns)
- Opportunities (e.g., unexploited feedstock, new markets, EU funding, defossilisation momentum)

- Threats (e.g., unstable policy environment, market volatility, fragmented supply chains)

A structured TOWS matrix was used to formulate actionable strategies by matching strengths/opportunities and addressing weaknesses/threats. Strategies were grouped into domains such as:

- Knowledge development & diffusion: R&D support, skills programmes, information tools.
- Direction of search: incentives, societal expectations, energy independence goals.
- Market formation & demand creation: consumer awareness, integration with food industry, subsidies for priority technologies.
- Governance and coordination: improved stakeholder engagement, co-creation in planning, fast-track procedures.

Bundling of Measures

To increase systemic impact, measures were grouped into **strategic bundles**, each addressing a major challenge and balancing trade-offs between impact, feasibility, and sustainability. Bundling enabled:

- Strengthening cross-sectoral synergies;
- Compensating for individual measures' weaknesses;
- Ensuring multi-dimensional benefits (economic-environmental-social).

Conclusion

The methodological approach combines analytical evidence, expert co-creation, and strategic foresight to design a coherent and transferable framework for integrating circular bioeconomy measures into the CAP and national policies. Through desk research, Delphi consultations, and multi-criteria strategic tools (matrices, PESTEL, SWOT/TOWS, SNA), the process ensures that the resulting Central European Bioeconomy Strategy and Action Plan is robust, comparable across countries, and aligned with regional and EU-level bioeconomy goals.

RESULTS AND DISCISSION FOR STRATEGIC ORIENTATION FOR POLICY MEASURES

CAP's Role in National Bioeconomy Integration

The Common Agricultural Policy (CAP) serves as the primary instrument for greening primary production and building circular bioeconomy value chains in the partner countries. Across the six Central and Eastern European (CEE/ioeast) partner countries, the CAP provides the operational backbone, which is reinforced by national circular economy, energy, and innovation strategies.

Key Findings on CAP Structure

Common Framework, Variable Effectiveness: CAP functions as a performance-based framework with two stable pillars (Pillar I: income support/market measures; Pillar II: rural development/innovation). However, implementation effectiveness depends heavily on national governance, monitoring systems, and capacity.

- Policy Alignment: All six CAP Strategic Plans (2023–2027) translate EU objectives into national sustainability priorities. Alignment is improving, with countries like Slovakia and Slovenia explicitly embedding bioeconomy in their CAP Strategic Plans (SPs). Croatia is finalising a Bioeconomy Strategy, with a dedicated cross-ministerial coordination body planned.
- Operational Levers: CAP provides strong levers for circular transformation, with Eco-schemes scaling sustainable management and Pillar II investments building processing, logistics, and renewable systems.

Key Instruments and Implementation Effectiveness

The CAP instrument mix—eco-schemes, investments, and knowledge systems (AKIS)—is functionally converging to support circular bioeconomy, even if not explicitly labelled as such.

- **Eco-Schemes (Pillar I): Mainstreaming Lever** Eco-schemes are the main entry point for climate-smart and circular practices, such as cover crops, reduced tillage, pollinator habitats, and precision nutrient management.
    - Czechia allocates 30% of its Pillar I budget to eco-schemes , Hungary's AÖP promotes cover crops and extensive grazing , and Poland targets carbon farming and nutrient management.
    - Eco-schemes successfully drive behavioural change when linked to clear guidance and advisory support.
- **Pillar II Investments: Structural Transformation Engine**
    - Pillar II investments serve as the engine for structural change and circular value chains.
    - They finance farm modernisation, sustainable processing, renewable energy (biogas, bio-based processing), biomass logistics, and circular clusters.
    - Agroforestry and forestry measures, led by Croatia and Hungary, are bridging agriculture and the bioeconomy by promoting afforestation and modern wood processing.

- **Knowledge and Cooperation (AKIS, EIP-AGRI, LEADER)**
    - Knowledge Systems ensure that innovation translates into practice by reinforcing advisory services, demonstration farms, and multi-actor groups. Croatia's AKIS Coordination Body and Hungary's Innovation & Digitalisation Unit illustrate structured approaches.
    - LEADER and LAGs were identified by experts as the most effective CAP mechanisms for promoting the circular bioeconomy at the local level, successfully mobilising community-driven innovation.
    - EIP Operational Groups are promising but underused innovation mechanisms for collaboration, though their impact is reduced by bureaucracy and fragmented funding.

Structural Challenges and Strategic Opportunities

Despite the existing tools, CAP implementation is constrained by recurring structural challenges:

- Administrative complexity and bureaucracy: Excessive documentation and slow investment procedures deter small and medium farms from participating in innovative or bioeconomy-related actions.
- Policy fragmentation and weak integration: Bioeconomy objectives are not systematically embedded in CAP instruments. The absence of a national bioeconomy strategy in some countries (e.g., Poland) and weak cross-sector coordination limit coherence and visibility. Experts noted that most Ministries of Agriculture do not see bioeconomy as a strategic priority.
- Market and capacity barriers: Small farm structures, high logistics costs, and insufficient renewable/processing infrastructure hinder circular business models (e.g., biogas, composting). Furthermore, advisory services (AKIS) lag in supporting circular concepts like carbon farming and agroforestry.
- Insufficient financing: Experts agreed that Pillar II financing is insufficient to cover the capital requirements of cutting-edge technologies like biomanufacturing or advanced biomass processes.

Strategic Opportunities and Directions

The current CAP toolbox provides strong opportunities that can be accelerated by five strategic directions:

- Simplify administration: Implement SME-friendly access and reduce administrative burden.
- Improve targeting: Target funds for small, organic, and High Nature Value (HNV) farms to enhance fairness and environmental impact.
- Make cooperation the default: Use LEADER, EIP, and Cooperation measures to create integrated circular territories.
- Digital enablers: Use precision and digital tools as enablers for eco-scheme performance.
- Introduce bioeconomy measures and indicators: Implement clear indicators (e.g., carbon retained, nutrients recycled, local value added) for visibility and policy alignment.

Expert Consensus on CAP Reform (Delphi Findings)

Delphi consultations with regional experts revealed a moderate consensus that while CAP has the structural foundation, its operationalization currently lacks a clear direction to truly drive the circular bioeconomy.

CAP Instrument/ Aspect	Expert Consensus	Key Insight on Reform
Overall CAP Effectiveness	Moderate	CAP is a possible approach, but the system is not practically useful due to bureaucracy, institutional impediments, and lack of strategic priority for bioeconomy in ministries.
LEADER and LAGs	High	Identified as the most effective local mechanisms for promoting the circular bioeconomy, but require scaled-up funding and expertise to embed bioeconomy thinking.
EIP Operational Groups	Mixed	Promising, but underused innovation mechanism. Needs simplification, stable financing, and long-term continuity to move from isolated pilots to transformative networks.
Support for Bioeconomy Markets	Limited	CAP only limitedly contributes to market development for products like biomaterials and biogas. Market growth is mostly driven by energy/industrial policies, and CAP funding does not adequately support commercialisation or demand creation.
Pillar II Investment Level	Insufficient	Strong consensus that the investment level is too low to support innovative technologies like biomanufacturing and advanced biomass processes.
Short Supply Chains	Moderate to High	The greatest financial support is needed for digital and direct sales systems to connect producers with consumers, ensuring visibility and continuous engagement.

Summary of Key Recommendations

To transform fragmented initiatives into a coherent, systemic, and measurable circular bioeconomy, the following actions are recommended:

- **Governance and coordination:** Establish national bioeconomy coordination bodies or standing platforms to link agriculture, energy, environment, and industry, ensuring policy coherence and shared monitoring systems.
- **Financing and investment:** Prioritize long-term, outcome-oriented funding, and explore innovative instruments (e.g., blended finance, revolving funds) for circular infrastructure and biorefineries.
- **Knowledge and innovation:** Strengthen AKIS and EIP-AGRI by training advisors, expanding demonstration farms, and fostering operational groups focused on carbon farming, agroforestry, and bio-based products.
- **Market development:** Develop bioeconomy markets through targeted incentives for bioproducts, sustainable proteins, and waste valorisation. Strengthen support for short supply chains and digital platforms to increase consumer trust and demand for sustainable products.
- **Policy integration:** Mainstream the bioeconomy as a horizontal priority in the next CAP (post-2027). Align CAP with National Energy and Climate Plans (NECPs) and Smart Specialisation Strategies (S3).

Discussion of results to support policy measures development

Discussion on Strategic Actions to support bioenergy (biofuels and biogas)

Biogas production represents a pivotal element of the bioeconomy transition in Central Europe. Both Poland and Slovenia possess significant agricultural biomass resources and industrial byproducts suitable for anaerobic digestion and biomethane production. Yet, despite favorable EU climate and CAP frameworks, sectoral development remains constrained by regulatory uncertainty, limited integration of biomass flows, and fragmented stakeholder cooperation.

Drawing on expert TOWS analyses and strategic action plans, this brief outlines priority policy directions for unlocking the potential of biogas within national and regional bioeconomy strategies. Both countries can mutually reinforce their biogas policy frameworks through EU-level cooperation—particularly in research standardization, technology transfer, and green finance design. Regional collaboration could foster a Central European Biogas Knowledge Hub, harmonizing data, certifications, and investment pipelines.

Biogas technologies in Poland and Slovenia stand at the intersection of **energy transition**, **rural revitalization**, and **circular economy development**. Effective policies must bridge technological maturity with societal trust, ensuring regulatory clarity, financial accessibility, and educational support. By aligning national actions with EU Green Deal objectives and fostering cross-border cooperation, both countries can transform biogas from a niche energy source into a cornerstone of sustainable regional development.

Discussion on Strategic Actions to regenerative agriculture and precision farming

Central and Eastern Europe (CEE) sits at the crossroads of two major EU transitions:

1. The Green Deal's Farm to Fork and Biodiversity strategies, which call for sustainable intensification and circular use of resources.
2. The digital and data-driven transformation of agriculture through precision tools, AI, and smart farming.

Countries like Poland, Slovenia, and Slovakia already show strong innovation potential in regenerative and precision agriculture but face persistent barriers — small farm structures, weak digital infrastructure, fragmented advisory systems, and uneven CAP implementation.

Regenerative and precision farming together offer a coherent pathway to enhance soil health, water retention, biodiversity, and carbon storage while increasing productivity and resilience.

Regional implications: To counter policy inertia and regulatory fragmentation, CEE governments should develop regional soil health observatories and digital traceability platforms that feed directly into CAP performance monitoring. CEE can position itself as a testbed for regenerative digitalization using field-level data, soil health indicators, and digital traceability to justify CAP payments and carbon farming incentives. The CEE region must shift from fragmented pilot initiatives to systemic frameworks — e.g., CAP-recognized soil monitoring protocols, regionally aligned certification standards, and interoperable farm data systems.

Discussion on Strategic Actions to support bioprocessing and biomaterials

The experts from the Central and Eastern European (CEE) countries participating in the BIOEAST initiative have identified the development of bioprocessing and biomaterials as a strategic priority for strengthening regional bioeconomy capacity. Their insight provides a comprehensive understanding of the internal and external factors shaping the sector, which, when linked to the evolving Common Agricultural Policy (CAP) beyond 2027, offers a structured approach to policy design and implementation.

Strategic Actions and CAP-Relevant Measures

Based on the SWOT findings and the subsequent strategic assessment, the experts propose a series of actions that can be directly linked to existing and future CAP instruments. These are summarised below according to their time horizon.

The BIOEAST experts' recommendations present a clear roadmap for strengthening bioprocessing and biomaterials in CEE countries through the CAP framework. Their vision aligns with the ongoing reform discussions on the post-2027 CAP, which aims to integrate bioeconomy, circularity, and climate objectives more explicitly into agricultural and rural policies. By operationalising the proposed measures—eco-schemes for carbon sequestration, investment support for modular biorefineries, advisory systems, certification mechanisms, and procurement incentives—Member States can accelerate the transition toward a sustainable bioeconomy. These actions will not only enhance rural competitiveness and resource efficiency but also contribute directly to the EU's Green Deal and circular economy objectives.

Synthesis Discussion: Advancing the Bio-Based Economy Across CEE

The CEE region's comparative advantage lies in its abundant biomass resources, strong agricultural base, and expanding scientific and technical infrastructure. However, these assets are offset by persistent governance and market fragmentation. Current policy frameworks often address bioenergy, agriculture, and materials valorization as separate domains, limiting synergies and hindering cross-sector investments. Consequently, a cohesive regional strategy that connects these sectors through coordinated governance and harmonized regulatory standards is increasingly recognized as essential for unlocking the bioeconomy's full potential.

Drawing from national and expert analyses across Poland, Slovenia, Slovakia, and other BIOEAST countries, a clear regional trend emerges: the shift from sector-specific bio-based development (biogas, biomaterials, regenerative agriculture) toward a systemically integrated regional bioeconomy.

While each sector demonstrates distinctive trajectories—biogas as a driver of decentralized energy, regenerative agriculture as a soil- and climate-restorative system, and bioprocessing as an industrial value-addition platform—they are united by common enablers and constraints. Fragmented regulations, limited coordination between agriculture and industry, and inconsistent CAP implementation remain the most critical bottlenecks. Conversely, the region's large biomass base, scientific competence, and increasing policy alignment with EU sustainability frameworks constitute strong leverage points for transformation.

A cross-sector synthesis underscores that CEE's bioeconomy transition must move beyond technological demonstration to institutional and infrastructural consolidation. The creation of regional "bioeconomy clusters" or "biohubs"—integrating feedstock aggregation, innovation services, and financial instruments—can serve as the backbone for scaling sustainable bio-based value chains across national borders.

Shared Leverage Points Across Sectors

Across all three bio-based domains, the overview reveals several recurring leverage points that underpin the CEE's bioeconomic transition. First, **resource abundance and circular potential** remain foundational. The region's agricultural residues, forestry by-products, and organic waste streams provide a robust feedstock base for both energy and materials applications. Yet, the absence of coordinated biomass registries and cascading use frameworks limits the efficient mobilization of these resources.

Second, technological and research capacity has advanced considerably. CEE countries have developed competitive expertise in anaerobic digestion, precision agriculture, and bio-based materials processing. Universities and emerging start-ups contribute increasingly to applied research and innovation ecosystems. Nevertheless, the lack of dedicated demonstration infrastructures and scale-up facilities continues to impede technology commercialization.

Third, alignment with European policy frameworks—particularly the Common Agricultural Policy (CAP), the Green Deal, and the Circular Economy Action Plan—offers an enabling policy environment. Through eco-schemes, Agricultural Knowledge and Innovation Systems (AKIS), and upcoming post-2027 CAP reforms, Member States can integrate bioeconomy priorities into national strategic plans. Lastly, growing public awareness and consumer demand for renewable energy, sustainable food systems, and biodegradable materials create positive market pull, reinforcing the bioeconomy's societal legitimacy.

Structural Weaknesses and Convergent Challenges

Despite favorable conditions, the region faces a series of interlinked structural challenges. Regulatory fragmentation remains a central impediment: national frameworks often separate waste, energy, and agricultural regulation, creating ambiguity for cross-sector operations such as digestate use, biomass trade, or residue valorization. Similarly, financial risk and limited de-risking mechanisms constrain small and medium enterprises (SMEs) from investing in early-stage or pilot bio-based projects.

In addition, digital and human capacity deficits undermine the uptake of precision and regenerative technologies, particularly in rural areas with low broadband coverage and limited advisory support. Public trust and social acceptance represent further barriers, as local opposition to bioenergy installations and skepticism toward novel bio-based products often delay project implementation. These challenges reflect deeper institutional inertia, highlighting the need for governance innovation, stakeholder engagement, and education to ensure the bioeconomy's social and environmental credibility.

A regional approach can mitigate these challenges by fostering policy harmonization, pooled financing, and shared capacity-building systems through existing platforms such as BIOEAST or a future "CEE Bioeconomy Alliance."

STRATEGIC ACTIONS AND POLICY COHERENCE

Integrating bioeconomy objectives within the CAP provides a practical pathway for addressing these systemic weaknesses. The sectoral analyses collectively demonstrate that bioenergy, regenerative agriculture, and biomaterials are not isolated silos but **mutually reinforcing domains** along a continuum of resource efficiency and value creation. For instance, biogas systems supply renewable energy and nutrient-rich digestate that can enhance regenerative farming, while regenerative practices provide sustainable biomass feedstocks for bioprocessing industries. Bioprocessing and biomaterials, in turn, create downstream markets that strengthen the economic viability of both upstream agricultural and energy systems. This interdependence suggests that national and regional policies should transition from sectoral support schemes toward **integrated bioeconomy governance models**. Embedding bioeconomy-specific indicators—such as residue valorization rates, soil carbon enhancement, or certified bio-based product uptake—within CAP monitoring frameworks could improve transparency and policy coherence. Furthermore, regional coordination platforms, such as the BIOEAST initiative, can serve as catalysts for harmonizing data systems, aligning certification standards, and pooling investment resources across Member States.

Strategic Priorities in perspective

Short-Term (2025-2030):

Deploy CAP eco-schemes incentivizing carbon sequestration, renewable energy use, and circular resource flows.

- Create regional pilot networks (biogas hubs, regenerative Living Labs, modular biorefineries) to demonstrate integrated bio-based systems.
- Establish national certification and biomass monitoring systems to ensure traceability and build public trust.

Medium-Long Term:

- Institutionalize bioeconomy governance structures (e.g., national bioeconomy councils, CEE coordination clusters).
- Mainstream bioeconomy education, digital literacy, and vocational training.
- Introduce fiscal incentives, revolving funds, and blended finance tools dedicated to bio-based SMEs.
- Embed the bioeconomy within a *CEE regional green growth strategy*, fully integrated with EU carbon neutrality objectives.
- Achieve a regionally distributed, cascade-oriented bioeconomy where rural territories function as innovation and production hubs within global circular markets.

The synthesis of expert analyses underscores that the technological readiness of CEE bio-based sectors increasingly outpaces institutional and financial capacities. Without coherent governance and market coordination, promising innovations risk remaining isolated pilot projects. The transition therefore demands a move from **fragmented national initiatives** to **cohesive regional frameworks** that align regulatory, financial, and informational infrastructures.

By leveraging existing cooperation structures such as BIOEAST and aligning future CAP strategic plans, the CEE region can transform from a resource supplier to a **knowledge-based, value-adding bioeconomy hub**. This transformation would simultaneously advance energy security, rural livelihoods, and environmental

resilience, positioning the region as a pivotal contributor to Europe's sustainable and competitive bioeconomy.

The post-2027 CAP must evolve beyond the current compliance-driven model to embrace measurable sustainability and circularity criteria. A key conclusion from the A3.1 evaluation assessment was that, while CAP 2023–2027 offers many entry points for bioeconomy, the actual uptake remains fragmented and indirect across Member States. Therefore, the next programming period (2028–2034) should explicitly embed bioeconomy objectives within its intervention logic, performance frameworks, and funding priorities.

Long Term:

The CAP's long-term direction will need to reflect systemic transitions in agricultural production, resource management, and consumer behaviour. Building upon A3.1 findings, three key transformations are essential:

1. **From sectoral to systemic policy design:** The bioeconomy must be recognised as a cross-sectoral field linking agriculture, forestry, food, and energy systems, requiring joint governance between ministries and agencies.
2. **From awareness to capability:** Member States need sustained investments in knowledge and skills, primarily through AKIS, to translate circular bioeconomy concepts into operational programmes.
3. **From pilot to mainstream:** Successful bio-based innovation pilots and eco-schemes must transition into standard CAP instruments supported by measurable indicators and transparent impact assessment.

The following orientations are proposed:

- Mainstream circular bioeconomy as a guiding principle across all CAP objectives.
- Establish measurable indicators for bioeconomy contribution, including renewable resource use, carbon storage, and waste valorisation.
- Enhance inter-ministerial coordination to align CAP implementation with bioeconomy, energy, and industrial strategies.
- Strengthen AKIS systems to integrate bioeconomy training and advisory support for farmers, processors, and local authorities.
- Increase transnational cooperation between BIOEAST countries to harmonise policy maturity and ensure inclusive uptake of circular bioeconomy practices.
- Promote consumer awareness and market uptake of bio-based products through CAP-supported education and communication actions.

Incorporating bioeconomy into the CAP 2028–2034 will accelerate the transition toward climate neutrality, resource efficiency, and rural innovation. CAP should:

1. Adopt explicit funding criteria linking interventions to bioeconomy performance;
2. Require monitoring systems that track resource circularity and added value creation; and
3. Promote knowledge-sharing mechanisms among Member States, with a focus on Central and Eastern Europe.

Policy Framework Overview for Advancing Bio-Based Sectors in Central and Eastern Europe

Central and Eastern Europe (CEE) stands at the forefront of the EU's green and digital transitions. The region's abundant biomass resources, strong academic base, and emerging innovation ecosystems create

a unique opportunity to develop a sustainable bioeconomy. However, systemic barriers—fragmented regulations, limited infrastructure, and low bioeconomy literacy—require coordinated policy action. This chapter synthesizes policy insights across three strategic domains: **bioenergy (biofuels and biogas)**, **regenerative and precision agriculture**, and **bioprocessing and biomaterials**, aligning them with the Common Agricultural Policy (CAP) and EU Green Deal objectives.

Bioenergy: Biofuels and Biogas

Policy Insights

- Strategic energy integration: Embed biogas into national energy policies as a pillar for distributed, low-carbon power and heat generation.
- Localization and circularity: Promote local biomass use to reduce fossil fuel dependence and strengthen rural economies.
- Regulatory simplification: Introduce fast-track permitting and legal recognition for secondary bio-based products (digestate, biofertilizers).
- Financial de-risking: Deploy revolving green funds, credit guarantees, and blended finance tools for SMEs investing in biogas technologies.
- Public trust building: Implement education campaigns and stakeholder engagement to mitigate NIMBY opposition.

Projected Regional Actions

- Establish biomass monitoring platforms and national registries for traceability.
- Create regional biohubs for feedstock aggregation and shared biogas infrastructure.
- Incentivize cascading biomass use through CAP eco-schemes and soil carbon payments.
- Foster cross-border cooperation via a Central European Biogas Knowledge Hub for harmonized standards and investment pipelines.

Regenerative and Precision Agriculture

Policy Insights

- Eco-scheme integration: Recognize regenerative practices (no-till, cover cropping, adaptive grazing) and precision tools as qualifying measures under CAP eco-schemes.
- Digital infrastructure: Invest in rural broadband and open data platforms to enable AI-driven soil health monitoring and smart farming.
- Advisory and education systems: Expand AKIS-based training, Living Labs, and certification programs for advisors and technicians.
- Outcome-based payments: Shift from practice-based to performance-based CAP measures linked to soil carbon and biodiversity indicators.

Projected Regional Actions

- Institutionalize soil health observatories and digital traceability platforms feeding into CAP monitoring.
- Develop regional clusters aligned with the EU Soil Mission for carbon farming and ecosystem service markets.

- Embed bioeconomy and precision farming modules in agricultural education curricula.
- Support cooperative models for precision equipment access and blended finance for smallholders.

Bioprocessing and Biomaterials

Policy Insights

- Cascade-oriented bioeconomy: Prioritize extraction of high-value components (biopolymers, proteins) before energy conversion.
- Infrastructure development: Fund modular biorefineries and biomass aggregation hubs through CAP rural development measures.
- Certification and quality assurance: Establish national systems for bio-based inputs and compostable materials to build consumer trust.
- Market pull mechanisms: Introduce green public procurement targets for certified bio-based products in construction, packaging, and textiles.

Projected Regional Actions

- Expand eco-schemes rewarding soil carbon enhancement and cascading biomass use.
- Integrate bioeconomy indicators into CAP monitoring frameworks (e.g., tonnes of residues valorized, operational biorefineries).
- Create dedicated bioeconomy investment windows for SMEs and regional hubs.
- Promote cross-sectoral cooperation via BIOEAST to harmonize standards and accelerate technology transfer.

CAP integration rationale

The CAP provides the most powerful lever for embedding bioeconomy objectives in CEE countries:

- Eco-Schemes (Pillar I): Reward regenerative practices, precision technologies, and cascading biomass valorization.
- EAFRD Investments (Pillar II): Finance biogas plants, modular biorefineries, and cooperative precision infrastructure.
- AKIS and Technical Assistance: Support knowledge transfer, advisory services, and demonstration projects.
- Monitoring and Data Governance: Embed soil health and biomass traceability indicators in CAP performance frameworks.

By aligning national CAP Strategic Plans with EU Green Deal and Soil Mission objectives, CEE countries can:

- Transform agriculture into a resilient, high-value, circular system.
- Achieve carbon neutrality and biodiversity gains while improving rural competitiveness.
- Position themselves as Europe's living laboratory for sustainable bioeconomy, leveraging cross-border cooperation and EU cohesion funds.

CONCLUSION AND POLICY IMPLICATIONS FOR STRATEGIC ORIENTATION FOR POLICY MEASURES IN CEE/BIOEAST COUNTRIES

The synthesis of expert-based SWOT analyses across the bioenergy, regenerative agriculture, and bioprocessing sectors demonstrates that Central and Eastern Europe (CEE) occupies a strategically significant position in Europe's bioeconomy transition. Technological readiness in biogas, regenerative soil management, and bioprocessing contrasts sharply with institutional lag in governance and market coordination. To realize its full potential, the region must transition from isolated, sector-specific initiatives toward an integrated, multi-sectoral bioeconomy system that aligns energy, agriculture, and industry within a coherent policy framework.

This transition will require embedding bioeconomy objectives within **national CAP Strategic Plans**, aligning them with EU Green Deal priorities, and establishing mechanisms for transnational coordination through platforms such as **BIOEAST**. The integration of cascading biomass use, carbon farming, and circular material flows can transform the region's comparative resource advantage into a competitive innovation system — positioning CEE not as a supplier of raw materials, but as a producer of high-value, sustainable bioproducts.

Policy Coherence and Governance Innovation

To achieve this, policy coherence must become the cornerstone of regional bioeconomy governance. The analyses highlight that the most significant efficiency gains will stem from integrating existing EU instruments—particularly the Common Agricultural Policy (CAP), the Circular Economy Action Plan, and the Green Deal Industrial Plan—into a unified framework for sustainable rural and industrial development.

Within the CAP architecture, **eco-schemes (Pillar I)** can reward farmers for measurable outcomes in soil carbon sequestration, nutrient cycling, and cascading biomass valorization. **Rural development measures (Pillar II)** can provide investment support for modular biorefineries, biogas clusters, and precision agriculture infrastructure. Simultaneously, **AKIS (Agricultural Knowledge and Innovation Systems)** should be strengthened to facilitate advisory services, capacity-building, and the transfer of innovation to practice.

Governance innovation at both national and regional levels is essential. The creation of **national bioeconomy councils** — supported by a **Central and Eastern European Bioeconomy Coordination Platform** under the BIOEAST framework — would enhance policy alignment and data harmonization. Such institutions could facilitate coordinated funding, common certification standards, and transparent biomass registries, ensuring that regional initiatives are synergistic rather than duplicative.

Financing and Market Instruments

A major policy implication of the expert insights concerns the need for **dedicated financial instruments** to de-risk innovation and stimulate private investment. Establishing **bioeconomy investment windows** within national or EU-level green financing mechanisms could provide revolving funds, credit guarantees, and blended finance to support SMEs, start-ups, and cooperative ventures.

Equally important is the creation of **demand-side incentives** through **green public procurement (GPP)** policies. Mandatory procurement quotas for certified bio-based materials in public construction, packaging, and textile sectors would generate stable domestic markets and improve investor confidence. Fiscal incentives—such as tax credits for bio-based product certification or renewable input substitution—can further accelerate adoption and commercialization.

The development of robust physical, digital, and human capital infrastructures represents another key priority. **Regional biohubs and Living Labs** that integrate bioenergy, regenerative agriculture, and bioprocessing should be established as demonstration ecosystems for circular bioeconomy practices. These can serve as innovation nodes linking farmers, researchers, and industry, thereby bridging the gap between research and market.

Regional Cooperation and the European Dimension

Given the shared structural and institutional characteristics of the CEE countries, **regional cooperation is indispensable**. The BIOEAST initiative provides a foundational platform for knowledge exchange, policy learning, and research coordination. Building upon this, a **Central European Bioeconomy Alliance** could institutionalize collaboration in standardization, technology transfer, and investment mobilization.

Through joint data infrastructures and harmonized sustainability indicators, the CEE region can contribute significantly to EU-wide monitoring systems for the bioeconomy and regenerative farming. This would ensure alignment with overarching objectives such as the EU Green Deal, the Farm to Fork Strategy, and the Soil Mission. In doing so, CEE can emerge not only as a beneficiary of EU cohesion and agricultural funds but as a **proactive policy laboratory for sustainable bio-based transformation**.

The expert-driven roadmap demonstrates that the long-term vision for the CEE bioeconomy should be that of a **distributed, cascade-oriented, and innovation-led system**. In this model, rural territories serve as nodes of both production and innovation—linking local resource bases with global circular value chains. By operationalizing strategic actions proposed, the CEE region can transform its structural heterogeneity into a source of strength, achieving both economic resilience and ecological sustainability. Aligning regional actions with the post-2027 CAP reform and the EU Green Deal would consolidate CEE's role as Europe's **living laboratory for the circular and sustainable bioeconomy**.

ACTION PLAN: AREAS OF INTEREST AND GUIDING PRINCIPLES

Areas of interest of Action Plan

The transition towards a competitive, resilient and sustainable bioeconomy in Central Europe requires an integrated and systemic policy approach. Based on extensive analytical work and stakeholder consultations, six interlinked areas of interest have been identified as critical for mainstreaming circular bioeconomy principles into agricultural and rural development policies, particularly within the Common Agricultural Policy (CAP) framework.

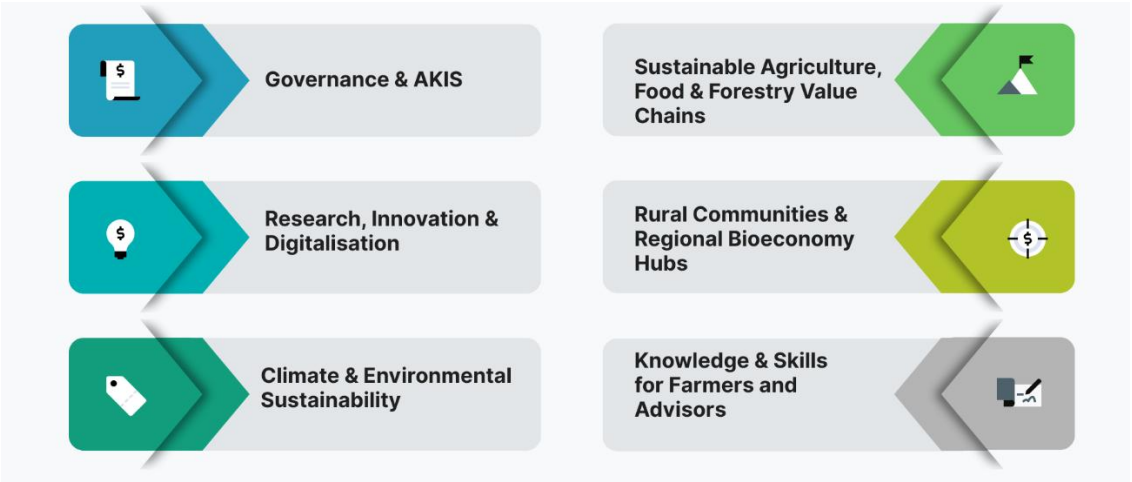

Figure 4. Six areas of interest for the Action Plan

Governance & AKIS

Effective governance and well-functioning Agricultural Knowledge and Innovation Systems (AKIS) form the backbone of the bioeconomy transition. AKIS connects farmers, advisors, researchers, businesses and policymakers, enabling the co-creation, circulation and application of knowledge. The CAP 2023–2027 has elevated AKIS as a cross-cutting priority, signalling a shift from top-down governance towards network-based, participatory models. Looking ahead to the post-2027 CAP, stronger AKIS governance will be decisive for results-based and performance-oriented policies. Instruments such as policy labs, living labs and regulatory sandboxes can support experimentation, transparency and learning, while professional advisory services and innovation networks (e.g. EIP-AGRI) are essential to translate policy goals into practice—particularly in Central and Eastern Europe, where institutional fragmentation and limited advisory capacity persist.

Research, Innovation & Digitalisation

Research, innovation and digitalisation are key enablers of the green and digital transition of agriculture and the bioeconomy. They underpin resource efficiency, emissions reduction and system resilience. Digital

tools—such as remote sensing, IoT, artificial intelligence and digital twins—support precision farming, traceability of biomass flows and robust monitoring, reporting and verification (MRV) systems. However, technological deployment alone is insufficient. Effective uptake requires open data standards, institutional readiness, skills development and trust within AKIS. Strengthening regional innovation ecosystems, bioeconomy hubs and living labs is particularly important in Central Europe to bridge regional disparities and ensure better absorption of EU and national funds.

Climate & Environmental Sustainability

Climate neutrality, ecosystem protection and adaptation to climate change are central objectives of EU agricultural and bioeconomy policies. Agriculture and land use can significantly contribute to EU climate targets if regenerative and circular practices are widely adopted. This requires a shift from compliance-based support towards result-based agri-environment-climate measures that reward measurable ecosystem services such as soil carbon sequestration, nutrient efficiency and biodiversity enhancement. Digital MRV systems and AKIS support are crucial for credible implementation. Circular bioeconomy solutions—such as cascading biomass use, nutrient recycling, biochar, digestate utilisation and precision irrigation—offer simultaneous climate, environmental and economic benefits, especially in climate-vulnerable Central European regions.

Sustainable Agriculture, Food & Forestry Value Chains

Sustainable and circular value chains are essential for reducing dependence on fossil resources, strengthening rural economies and increasing competitiveness. Mobilising agricultural residues, forestry by-products and organic waste enables renewable energy production, bio-based materials and circular nutrient management. Short, transparent and traceable supply chains—supported by digital product passports and certification—enhance consumer trust and fair value distribution. Integrating agriculture, forestry and bio-industrial sectors supports cascading biomass use and creates synergies across value chains, contributing to low-carbon materials, renewable construction and advanced bio-based products.

Rural Communities & Regional Bioeconomy Hubs

Rural areas are the territorial core of the bioeconomy transition. Regional bioeconomy hubs act as platforms for cooperation, innovation and value creation by linking farmers, SMEs, research institutions and public authorities. These hubs enable local mobilisation of biomass, circular nutrient flows and decentralised renewable energy solutions while retaining value in rural economies. In Central Europe, hub-based models—such as micro-biogas plants, biomass mobilisation platforms or modular biorefineries—offer a flexible alternative to centralised infrastructure and support social acceptance through participatory governance and community engagement.

Knowledge & Skills for Farmers and Advisors

Human capital is a decisive factor for successful implementation of bioeconomy policies. Farmers and advisors increasingly operate in complex systems integrating sustainability, digitalisation and innovation. Lifelong learning, modular training pathways and micro-credentials are therefore essential. Innovation

brokers and advisory networks play a key role in translating research outcomes into practice and accelerating uptake. In Central Europe, targeted investments in skills development, advisory professionalisation and digital learning tools are needed to overcome fragmentation and ensure that farmers and advisors can effectively implement result-based eco-schemes, renewable energy pilots and circular management practices.

Guiding principles of development of Action Plan

The Central European Bioeconomy Strategy and Action Plan is guided by a coherent set of principles that translate strategic ambition into coordinated, actionable, and measurable policy directions. These principles are grounded in the analytical evidence from Activity A3.1, the Delphi and expert consultations under Activity A3.2, and the overarching objective of Work Package 3: to strengthen policy learning, enhance coherence, and accelerate the integration of circular bioeconomy objectives into the Common Agricultural Policy (CAP) and related national frameworks.

Together, they provide a unifying framework for the six thematic intervention areas and reflect a shared commitment to a sustainable, inclusive, and innovation-driven bioeconomy transition in Central Europe.

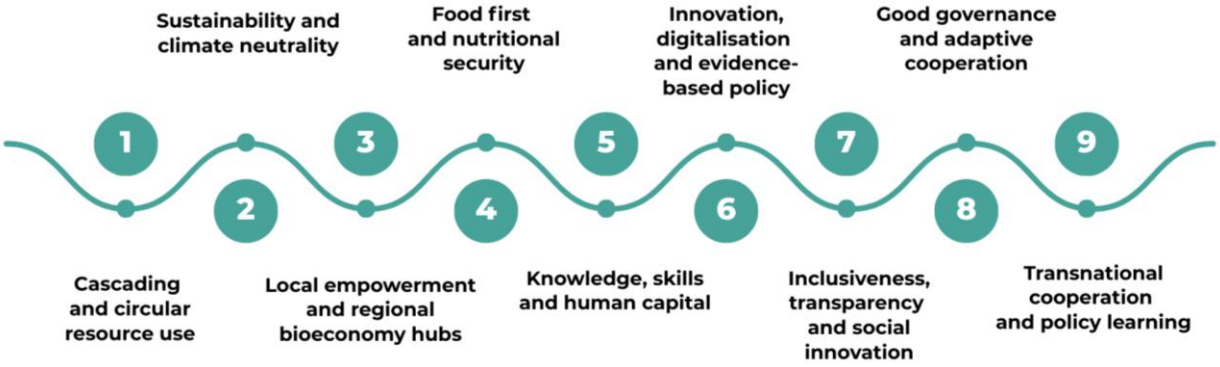

Figure 5. Principles of translating the strategic ambition into policy directions

- **Sustainability and climate neutrality**

Sustainability is the overarching principle of the Action Plan. All bioeconomy measures must align with the European Green Deal, the Farm to Fork Strategy, and the EU Bioeconomy Strategy, ensuring that production and consumption operate within planetary boundaries. Circular bioeconomy solutions contribute to climate neutrality by 2050 through ecosystem regeneration, soil and water protection, biodiversity enhancement, and emissions reduction. The shift from compliance-based to performance-based instruments—such as result-based eco-schemes, carbon farming, nutrient substitution, and renewable energy integration—translates environmental objectives into measurable and economically viable outcomes.

- **Food first and nutritional security**

Food and nutritional security remain the primary priority of the bioeconomy. The "Food First" principle ensures that biomass valorisation pathways do not undermine food availability, affordability, or quality. Bioeconomy development must strengthen resilient local food systems, reduce waste, and avoid competition between food, feed, and non-food uses of biomass, safeguarding citizens' basic nutritional needs while supporting sustainable supply chains.

- **Innovation, digitalisation and evidence-based policy**

Innovation and digitalisation are central enablers of systemic transformation. Research excellence, digital technologies, and smart data systems—such as remote sensing, IoT, digital twins, and monitoring, reporting and verification (MRV)—form the foundation of adaptive and transparent governance. Living Labs, Policy Labs, and regulatory sandboxes enable the testing of bio-based solutions under real conditions. Embedding digital intelligence into policymaking ensures that bioeconomy governance is evidence-based, measurable, and continuously improving.

- **Good governance and adaptive cooperation**

Effective, participatory, and transparent governance is a prerequisite for a successful bioeconomy transition. Agricultural Knowledge and Innovation Systems (AKIS) act as the central governance backbone, linking science, advisory services, practice, and policymaking. The Action Plan promotes adaptive, multi-actor cooperation across ministries, research institutions, advisory bodies, and private actors. Policy coherence, accountability, trust, and continuous learning are essential to align CAP instruments, national strategies, and regional initiatives in a rapidly evolving policy and technological landscape.

- **Cascading and circular resource use**

Cascading use of biomass is a core principle of the circular bioeconomy. Biological resources should prioritise high-value applications—such as food, feed, materials, and biochemicals—before energy recovery. This hierarchy maximises value creation from limited bio-resources, enhances resource efficiency, and reduces environmental pressure. Regional biorefineries, nutrient-cycling platforms, and cascading biomass hubs enable local valorisation of residues and by-products while retaining value within regional economies.

- **Local empowerment and regional bioeconomy hubs**

Rural communities are central actors in the bioeconomy transition. Regional bioeconomy hubs provide place-based platforms that combine infrastructure, cooperation networks, and innovation ecosystems to mobilise local resources and entrepreneurship. Linked to LEADER, EIP, and inter-municipal cooperation, these hubs ensure that value creation, jobs, and innovation benefits remain in rural areas, empowering communities as active drivers of transformation.

- **Knowledge, skills and human capital**

Human capital underpins the bioeconomy transition. Farmers, advisors, and entrepreneurs require continuous access to knowledge, skills, and innovation brokerage. Strengthening AKIS-based learning,

modular training pathways, micro-credentials, and advisory professionalisation ensures that innovation reaches practice. Lifelong learning, digital education tools, and peer-to-peer exchange enable the adoption of regenerative, circular, and data-driven solutions in an inclusive manner.

- **Inclusiveness, transparency and social innovation**

The bioeconomy transition must be fair, inclusive, and socially embedded. Women, youth, smallholders, and local entrepreneurs should benefit from new opportunities. Participatory governance, transparency, and citizen engagement—demonstrated through Living Labs and prosumer-oriented approaches—build trust, legitimacy, and social ownership. Social innovation and behavioural change are essential complements to technological progress.

- **Transnational cooperation and policy learning**

Cross-border cooperation is essential to overcoming fragmentation and bridging the East-West policy maturity gap in Central Europe. Transnational peer learning, foresight, and coordination within the BIOEAST Initiative support harmonisation of approaches, shared standards, and collective capacity building. This cooperation strengthens regional competitiveness and positions Central Europe as a unified contributor to the post-2027 CAP and EU bioeconomy agenda.

PROPOSED POLICY MEASURES FOR CIRCULAR BIOECONOMY IMPLEMENTATION IN CAP AND AGRICULTURE SECTOR

The strategic approach of the Central European Bioeconomy Strategy and Action Plan builds on **six interlinked pillars** that together define how circular bioeconomy objectives can be effectively integrated into the Common Agricultural Policy (CAP). Each pillar represents a systemic area of intervention where policy, knowledge, and innovation converge to create sustainable, regenerative, and competitive rural systems.

Below we present the Action Plan, which includes a selection of policy measures drawn from the comprehensive list of 100 measures provided in the complementary report. The measures are organised by the six BIOEAST countries, with shading used to distinguish between them (as illustrated in the tables below).

The selected measures represent those considered most relevant for further national-level discussion and joint transnational cooperation. They provide a foundation for aligning policy approaches, identifying synergies, and facilitating the exchange of experience and good practices across the BIOEAST macro-region.

Together, these six pillars provide a strategic roadmap for embedding circular bioeconomy principles into the CAP. They connect governance, innovation, and human capital to environmental and economic outcomes — ensuring that the next generation of agricultural and rural policies in Central Europe is:

Figure 6. The characteristics of next generation of agricultural and rural policies in CE

These pillars form the operational backbone of the Central European Bioeconomy Strategy and Action Plan, ensuring that the transition from fossil-based to bio-based systems becomes systemic, inclusive, and irreversible.

For the purpose of this Action Plan, implementation timeframes are defined as follows:

- Short-term refers to actions that can be initiated and delivered within the current CAP programming period, primarily through adjustments of existing instruments, pilot actions, or targeted support measures. These actions typically do not require major legislative changes and can be implemented within 1–2 years.
- Mid-term refers to actions that require more extensive coordination, capacity building, infrastructure development or regulatory alignment. Their implementation usually spans 3–5 years and may involve amendments to CAP Strategic Plans, the establishment of new coordination mechanisms, or scaling up of pilot initiatives.
- Long-term refers to structural or systemic transformations that extend beyond a single programming cycle and are expected to be fully realised beyond 5 years, often in alignment with the post-2027 CAP framework and broader EU bioeconomy and climate objectives.

Governance & AKIS – building adaptive and integrated knowledge systems

Governance and Agricultural Knowledge and Innovation Systems (AKIS) are critical enablers for implementing circular bioeconomy measures within the Common Agricultural Policy (CAP) across the BIOEAST region. While many Central and Eastern European countries face similar challenges—fragmented institutional responsibilities, limited advisory capacity and insufficient integration of environmental data into policymaking — analysis has demonstrated that these barriers can be addressed through targeted, result-oriented policy instruments embedded in existing CAP structures.

The Governance & AKIS pillar therefore focuses on operational measures that link regulation, incentives, advisory support and market creation. Rather than introducing new administrative layers, the proposed policy measures strengthen coordination, monitoring, certification and knowledge transfer mechanisms that allow circular bioeconomy practices to be implemented, verified and rewarded at farm and regional level.

No.	Policy measure	Steps to delivery	Timeframe	Responsible type of actor	BIOEAST relevance country
1	Result-based reduction of GHG emissions in biofuel feedstock crops through regenerative practices and residue-to-biogas systems	Develop and pilot a result-based eco-scheme combining farm-level GHG accounting (incl. SOC proxies), regenerative practices and residue-to-biogas linkages, aligned with RED III and national climate requirements; Integrate advisory modules, digital farm logs and annual monitoring, reporting and verification into CAP eco-schemes and national reporting to the European Commission.	short-mid (preparation and pilot 2026-2027), followed by long-term implementation and monitoring (2028-2034)	ministries responsible for agriculture, climate and energy; paying agencies; research institutions; environmental and emissions authorities; AKIS and advisory services; bioenergy and farmer organisations; IT providers	Croatia (HR)
2	Establishment of a national agricultural emissions monitoring system with AKIS support for farmers and advisors	Develop and standardise a national farm-level GHG/SOC accounting and MRV methodology (kg CO_2e/ha), aligned with RED III / NCW, including digital farm logs, remote sensing and verification protocols.; Design and deploy an interoperable digital monitoring and reporting system (IACS/LPIS/FSDN), supported by AKIS advisory modules, certified training for advisors and farmers, and farm-level audits.; Establish a national coordination hub and operate annual verification and reporting to the Commission, with open aggregated data, advisory rollout and large-scale farmer communication.	short-mid-long term	Ministries, environmental agencies, AKIS coordinators, advisory services	Poland (PL) Croatia (HR)
3	Creation of bioeconomy policy labs and regulatory sandboxes to accelerate adaptive governance and innovation	Establish multi-actor platforms; select pilot regulations and innovations; test under real conditions; feed lessons into CAP and national policies; Design a national framework for policy labs and sandboxes (objectives, eligibility, funding envelopes, evaluation protocols) using portfolio-based management, and launch initial pilots in priority regions and value chains.; Set up a central support unit to provide common methodologies, tools and cross-lab learning, and scale successful pilots across regions and sectors while feeding results into regulatory adjustments, CAP eco-schemes and bioeconomy strategies.; Institutionalise policy labs as a permanent element of adaptive governance, including regular open calls, annual showcases and an	short-mid-long term	Ministries, innovation agencies, research institutions	Slovenia (SI) PL

		annual Bioeconomy Policy Innovation; Report synthesising tested solutions and their impacts.			
4	Establishment of micro-biogas plants and circular manure hubs through LEADER/EIP cooperation for local nutrient cycling and social acceptance	Expand circular manure and residue hubs to at least 70 by 2030, combining modular micro-AD units with shared logistics for collection, storage and pre-treatment.; Monitor technical, environmental and social performance (residues treated, CH_4/N_2O avoided, community acceptance indicators) with standardised annual reporting.; Carry out regional biomass mapping from municipality to regional level to identify dispersed residues, side-streams and optimal aggregation nodes.	short-mid-long term	Local authorities, cooperatives, Paying Agencies, advisory services	HR
5	Establish regional bioeconomy hubs and value-chain cooperation to supply material-grade feedstock for cascades before energy use	Deploy CAP Pillar II investment calls to establish regional bioeconomy hubs with laboratory, quality assurance, storage and logistics infrastructure enabling material-grade biomass supply.; Develop and pilot certification and conformity assessment protocols for material-grade feedstocks aligned with EU standards, validated through EIP Operational Groups and life-cycle assessment modules.; Integrate certified biomass flows into CAP reporting by linking volumes to eco-schemes and AECM outcomes on nutrient circularity and material-first cascading use.	short-mid-long term	Agriculture modernisation units, regional and national authorities, monitoring and standardisation bodies, research institutions, advisory services, producer organisations and SMEs	HR
6	Establish a national bio-based product certification and label interoperable with digital product passport (DPP) standards	Draft a national certification framework and conformity assessment protocols for bio-based products (biopolymers, advanced materials, bio-inputs) aligned with EU standards and DPP requirements, including biosafety and sustainability criteria.; Validate testing and life-cycle assessment modules through EIP Operational Group pilots across product categories, and deploy a national label supported by a public registry and API infrastructure interoperable with DPP.;	short-mid-long term	Ministries responsible for economy, agriculture and environment; monitoring and standardisation bodies; certification agencies; research institutions and laboratories; advisory services; SMEs and producer organisations; IT and registry operators	PL, SI, HR

		Train procurers, retailers and advisory services on certified bio-based products and procurement clauses, and scale certification through market uptake, public procurement and digital platform integration.			
7	Regional bio-based construction pilots	Identify municipalities and local SMEs for straw- and wood-based construction pilots and support experimental applications in public buildings (e.g. schools, kindergartens, rural administration).; Develop quality assurance protocols for bio-based construction materials (fire safety, thermal performance, compostability) and procurement playbooks for municipalities and housing cooperatives.; Scale validated solutions through public procurement and investment support to enable large-scale uptake of bio-based construction in rural and public buildings.	short-mid-long term	Local and regional authorities, research institutions and laboratories, standardisation and certification bodies, SMEs and construction service providers, ministries responsible for agriculture and public procurement	PL
8	Establishment of national bioproduct certification and activation of green public procurement (GPP) to build market demand	Design or update a national certification and labelling framework for bio-based and biodegradable products, covering performance, durability, biodegradation and life-cycle assessment, and aligned with EU taxonomy and ecolabel requirements.; Pilot validation and certification through EIP Operational Groups with independent testing and a public registry, while developing GPP guidance (training curricula, tender clauses and procurement criteria) and training public procurers.; Scale certification and GPP uptake nationwide by integrating certified products into public procurement, supporting SMEs with certification cost schemes, and monitoring market uptake and GPP expenditure.	short-mid-long term	Ministries responsible for agriculture, economy and public administration; standardisation and certification bodies; research institutions and laboratories; EIP consortia; advisory services; public procurers and local authorities; SMEs and producer organisations	SI
9	AKIS upskilling and national contact point for the agricultural bioeconomy	Develop and integrate national bioeconomy training modules (cascading use, biomaterials, residue valorisation, legal and financial navigation) into AKIS curricula, supported by modular training, digital toolkits and open learning resources for advisors and farmers.; Establish a National Contact Point (NCP) and helpdesk to broker funding (CAP, CBE-JU, Horizon Europe), support inter-ministerial alignment and embed bioeconomy scoring criteria into farm modernisation calls and advisory packages.; Roll out large-scale training nationwide and scale uptake by mainstreaming bioeconomy criteria across advisory services and	short-mid-long term	Ministries responsible for agriculture, climate and education; monitoring and paying agencies; research institutions and universities; AKIS and advisory networks; national R&D funding agencies; chambers and cooperatives	SI Slovakia (SK) Czechia (CZ)

		investment measures, achieving national coverage and measurable skills impact.			
10	Spatial biomass corridors & micro-hubs (material-first logistics)	Establish CAP investment grants for pre-processing, covered storage, drying facilities and quality-assurance labs, combined with performance-based contracts prioritising material-grade biomass output.; Deploy shared logistics assets (short-haul fleets, digital route optimisation) and long-term supply contracts with farmers and forest owners, supported by national certification lists, QA protocols and digital MRV farm logbooks.; Scale spatial corridors and micro-hubs delivering certified material-grade biomass, with continuous monitoring of quality pass rates, logistics efficiency and RED III sustainability compliance.	short-mid-long term	Agriculture modernisation units, ministries responsible for agriculture, regional and local authorities, producer groups and cooperatives, logistics SMEs, certification and inspection bodies, research institutions, advisory services, IT providers	HR
11	Result-based eco-scheme: certified algae inputs & precision dosing	Establish national eligibility rules and soil/nutrient plan requirements for parcels using certified algae-based biostimulants and biofertilisers, including product certification and safety thresholds.; Pilot precision dosing tools and digital logging with early adopters to validate nutrient substitution and soil benefit indicators, and launch CAP Pillar I eco-scheme payments supported by MRV systems.; Monitor nutrient reduction and soil proxy improvements via LPIS/IACS-linked data and scale the eco-scheme based on verified performance outcomes.	short-mid-long term	Ministries responsible for agriculture and digital transformation; paying agencies; chambers of agriculture; research institutions; advisory services; cooperatives and SMEs; IT and MRV platform providers	SI
12	Rural bioeconomy leader labs	Evaluate existing pilots and develop scaling guidelines, governance models and funding mechanisms for rural bioeconomy leader labs under LEADER and cooperation frameworks.; Expand and institutionalise a network of local bioeconomy labs to demonstrate circular solutions, integrate results into CAP reporting, and link labs with start-up voucher schemes supporting advisory, testing and business development services.	short-mid-long term	Ministries responsible for economy, agriculture and innovation; national and regional development agencies; universities and research institutes; innovation hubs, incubators and clusters	SI, SK
13	National fund for on-farm renewable energy self-sufficiency	Develop advisory toolkits and farm-level energy audit methodologies to support on-farm renewable energy solutions aligned with CAP climate objectives, and integrate performance indicators on energy self-sufficiency and GHG reductions.; Embed monitoring results into CAP reporting frameworks and support pilot deployments in selected municipalities and SMEs, including	short-mid-long term	Ministries responsible for agriculture and climate; advisory services and NGOs; research institutions; national R&D funding agencies; local and regional authorities;	HR

		demonstration projects in public and rural buildings to accelerate uptake and replication.		SMEs and agriculture modernisation units	
14	Carbon smart labels for farmers	Pilot a certification system for verified soil organic carbon gains at farm level, including clear certification rules, verification protocols and monitoring indicators (SOC and biodiversity).; Develop a consumer-facing label for products with verified climate benefits and integrate the smart label into CAP AKIS knowledge sharing and eco-scheme reporting.; Scale adoption through retailer and processor engagement, supported by digital platforms, to achieve broad market uptake of climate-labelled agri-food products.	short-mid-long term	Ministries responsible for agriculture; research institutions; certification bodies; advisory services; NGOs; retailers and producer organisations; digital platform providers	PL
15	Regional bio-input validation hubs & living labs (cooperation + investments)	Establish a national framework for regional bio-input validation hubs, defining quality assurance protocols, End-of-Waste compliance and transparent selection criteria for pilot initiatives.; Launch regional living labs via EIP Operational Groups to test bio-leached and circular inputs on demonstration farms, supported by AI/remote-sensing decision tools for dosing, timing and crop-soil adaptation.; Scale validated solutions through targeted investment grants for small-scale infrastructure (QA labs, drying, storage and logistics) and formalise supply contracts between waste operators and farmers.	short-mid-long term	Ministries responsible for agriculture and innovation; research and environmental authorities; plant protection and inspection services; regional governments; EIP consortia; research institutions and universities; advisory services; SMEs and cooperatives	SK
16	Carbon literacy campaign for farmers	Design country-tailored training modules on carbon farming, soil carbon and GHG mitigation, and roll them out via advisory services and universities using blended learning (workshops + online materials).; Launch a national media and outreach campaign featuring farmer case studies across TV, radio, press and social media, and maintain continuous updates of training content reflecting new CAP developments and practices.	short-mid-long term	Ministries responsible for agriculture; research institutions; advisory services; universities; chambers of agriculture; NGOs; education and media partners	Hungary (HU)
17	Creation of certification and validation schemes for circular bioproducts	Establish a national framework for circular bioproduct pilots defining eligibility, independence rules, evaluation methods and transparency safeguards, and launch comparative on-farm trials through EIP Operational Groups with data logged in a public registry.;	short-mid-long term	Ministries responsible for agriculture and environment; inspection and certification bodies; research institutions and universities; EIP consortia;	CZ

	through EIP pilots and AKIS guidance	Develop certification and labelling criteria (performance KPIs, life-cycle assessment modules, environmental safeguards) and draft national guidance for advisors, followed by scaling validated pilots into certified products.; Integrate certification results into AKIS advisory services and training, and operate a transparent public registry and reporting system covering validated protocols, certified labels and uptake indicators.		advisory services; producer organisations and SMEs; IT and registry providers	
18	Biomethane upgrades & digestate circularity (investments + cooperation)	Map existing farm-scale and industrial anaerobic digestion plants, assess upgrade potential and digestate management gaps, and prepare sustainability and quality-assurance guidelines.; Pilot AD upgrades via EIP Operational Groups (including nutrient management, short-haul logistics and CO_2 capture readiness), followed by CAP investment calls for biomethane upgrading, grid/CHP injection and digestate processing with performance-based top-ups.; Integrate plant meters, energy records and nutrient logs into CAP monitoring and scale upgraded plants delivering verified biomethane output and circular digestate use on fields.	short-mid-long term	Ministries responsible for agriculture, industry and energy; agriculture modernisation units; environmental and water funds; research institutions; regional energy and waste agencies; AD operators; farmer groups; advisory services; energy regulators	CZ, PL, HU

Research, innovation & digitalisation - accelerating the twin transition

Research, innovation and digitalisation constitute the backbone of the twin transition towards a climate-resilient, competitive and circular bioeconomy in the BIOEAST region. While Central and Eastern European countries demonstrate strong scientific capacity and growing innovation ecosystems, the uptake of research results at farm and value-chain level remains uneven. Fragmented innovation pipelines, regulatory uncertainty, limited interoperability of digital tools and insufficient demonstration under real farming conditions continue to slow down adoption.

This pillar therefore focuses on bridging research, innovation and practice by combining experimental testing environments, digital infrastructure, targeted investments and skills development. Rather than isolated R&I projects, the proposed measures embed innovation into CAP instruments, AKIS structures and regulatory feedback loops. Digitalisation—through precision farming, open data standards, MRV systems and digital twins—acts as a cross-cutting enabler, ensuring transparency, scalability and policy learning.

No.	Policy measure	Steps to delivery	Timeframe	Responsible type of actor	BIOEAST relevance country
1	Testing and regulatory sandboxing of microbial bio-products through EIP pilots and advisory integration	Establish a national coordination framework for microbial bio-product sandboxes, defining roles of managing and paying authorities, observer roles of competent inspection bodies, funding envelopes and evaluation protocols.; Launch and scale EIP Operational Group on-farm pilots testing microbial bio-fertilisers and biocontrol products under harmonised protocols, building an evidence base on efficacy, safety and soil microbiome impacts.; Integrate validated protocols into AKIS advisory guidance, certified training modules and transparent annual reporting, ensuring regulatory feedback and gradual uptake by farmers.	short-mid-long term	Ministries responsible for agriculture; plant health and seed inspection authorities; research institutions and universities (agriculture, biotechnology); EIP consortia; AKIS and advisory services; national R&D and innovation funding agencies; bioeconomy coordination platforms	PL
2	Acceleration of precision and digital farming adoption through investments and demonstration networks	Develop national investment guidelines for precision and digital farming, defining eligible technologies (e.g. GNSS/autoguidance, variable-rate application, sensors, robotics, precision irrigation), interoperability and open-data requirements, ceilings per holding, and standardised advisory adoption plans.; Establish a national demo-farm network combining university farms, advisory services and lead farmers to showcase precision technologies under real conditions, linked with co-funded CAP investment support for equipment and software adoption.; Roll out large-scale advisory and training programmes, including modular skill certificates for advisors and technology specialists, and monitor uptake and impacts through CAP monitoring systems (input efficiency, yield stability, energy and fuel savings).	short-mid-long term	Ministries responsible for agriculture, science and industry; paying and agriculture modernisation agencies; research institutions and universities; advisory services (public and private); producer groups, cooperatives and SMEs; IT and digital solution providers; statistical and monitoring bodies	PL, CZ, SK
3	Residue-to-liquid biofuels pilots (hydrogenation & pyrolysis) with sustainability QA	Establish national quality assurance (QA) and monitoring, reporting, and verification (MRV) standards for residue-to-liquid intermediates, including guidelines for contaminants, life cycle assessment (LCA), and compliance with the Renewable Energy Directive (RED).; Launch innovation operational groups under EIP pilots for hydrogenation of agri-food waste and pyrolysis of straw/woody residues, involving farmers, refiners, SMEs, universities, and research institutions to validate and scale up technologies.;	short-mid-long term	Ministries of Agriculture and Rural Development, Environment; Research institutions and universities related to agriculture and biofuels; National Chamber of Biofuels; Technical inspection bodies and	PL

		Deploy selective investment grants to support modular pilot units for residue pre-treatment, short-haul logistics, and feedstock handling.; Integrate digital MRV systems and process analytics (e.g., PAT-AI, digital twins) into pilot operations to optimise scale-up and report on sustainability outcomes.; Scale up to ≥35 pilots, validating ≥25 QA/MRV protocols and preparing a RED Annex IX-compliant domestic feedstock chain for Sustainable Aviation Fuel (SAF) and Hydrotreated Vegetable Oil (HVO).		laboratories; EIP consortia (farmers, SMEs, research institutions); funding bodies such as ARiMR, NCBiR, NFOŚiGW, PARP, National Contact Point for Horizon Europe; IT/AI providers; Advisory services	
4	Result-based eco-scheme: certified compostable agri inputs & plastic-residue reduction	Develop a national eligibility list of EN-certified compostable agricultural inputs (e.g. mulch films, trays, clips) and standardised digital reporting templates, including clear certification, compliance and soil-monitoring requirements.; Pilot a digital collection and delivery-note system with authorised composters to ensure full chain-of-custody verification of compostable plastics removed from fields.; Launch a CAP Pillar I result-based eco-scheme using a Plastic-Residue Avoidance Index (area × share of certified collection × field cleanliness score) as the payment basis, supported by advisory training and on-farm guidance.; Scale enrolment and certified collection nationwide, with progressive performance targets, aiming to achieve ≥90% certified collection rates and field cleanliness compliance by 2030 and beyond.	short-mid-long term	Ministries responsible for agriculture; paying agencies; input certification and compliance authorities; research institutions and universities; soil and environmental monitoring bodies; AKIS and advisory services; producer groups and cooperatives; authorised composters; SMEs supplying certified compostable inputs; digital platform providers	SI, HR
5	National wood traceability & owner cooperation	Develop a national digital registry architecture for wood flows, aligned with EU Deforestation Regulation (EUDR) due-diligence requirements, including open APIs, standardised data schemas and procurement templates enabling interoperability across forestry, processing and public authorities.; Launch innovation operational groups under EIP cooperation projects to pilot digital traceability tools with forest-owner	short-mid-long term	Ministries responsible for agriculture, forestry and environment; forestry services and state forest authorities; digital government and registry operators; research institutions and universities; forest-	SI, CZ

		associations, SMEs and processors, testing contracts, data exchange and compliance workflows under real market conditions.; Roll out a national onboarding programme for forest holdings and processors, integrating advisory and AKIS training modules, due-diligence toolkits and support for SMEs and owner groups.; Scale uptake by embedding traceability requirements in public procurement and market transactions, progressing towards full national deployment with high coverage of harvested volumes and active API users.		owner associations; advisory and AKIS services; SMEs and wood processors; standardisation and inspection bodies; public procurers	
6	Rural bioeconomy leader labs	Establish local innovation funds under LEADER/CLLD to enable Local Action Groups (LAGs) to pilot circular bioeconomy services in rural areas, such as repair hubs, reuse centres, short supply chains and community-based processing solutions.; Support an initial wave of 10–15 pilot Rural Bioeconomy Leader Labs, combining local authorities, cooperatives, SMEs, social enterprises and NGOs, with methodological support from research institutions and advisory services.; Evaluate pilots and develop scaling guidelines, governance models and financing mechanisms, followed by expansion of the Leader Lab network and systematic integration of results into CAP reporting, monitoring and mainstream rural development instruments.	short-mid-long term	Ministries responsible for agriculture and rural development; paying agencies; Local Action Groups; regional and local authorities; advisory services and AKIS networks; cooperatives and producer organisations; SMEs and social enterprises; research institutions and universities; NGOs and community organisations	SI, HU
7	Investments in precision farming and establishment of a national open data standard and repository for interoperability	Develop and adopt a national open standard for farm data, defining common schemas, APIs and cataloguing rules to ensure interoperability, vendor neutrality and secure data exchange across precision farming tools and public systems.; Establish a national repository and catalogue of precision farming tools and datasets, equipped with open APIs enabling integration with IACS/LPIS, advisory platforms and farm management systems.; Provide long-term investment support for farm-level precision packages (e.g. GNSS/RTK, sensors, variable-rate application kits, remote sensing subscriptions, connectivity upgrades and AI-based decision tools), combined with advisory adoption plans.;	short-mid-long term	Ministries responsible for agriculture and industry; national agricultural research agencies; IT partners and digital service providers; standardisation bodies; paying and agriculture modernisation agencies; research institutions and universities; advisory and AKIS services; producer groups and	CZ

		Deliver training programmes and modular skill certificates for farmers and advisors on precision technology adoption, data management and effective use of interoperable digital tools, and monitor uptake and impacts through CAP monitoring frameworks.		SMEs; statistical and monitoring authorities	
8	Bio-input pilots and regulatory feedback through innovation operational groups under EIP and AKIS	Develop common guidance dossiers and advisory protocols for bio-inputs, validated through multiple EIP Operational Group pilots, and integrate these protocols into Living Labs and AKIS advisory networks.; Launch innovation operational groups under EIP to map bio-input supply chains, test pre-processing solutions (e.g. drying, fractionation) and establish long-term contracts between farms, cooperatives and SMEs, ensuring compliance with waste, food and feed legislation and cascading-use principles.; Roll out modular training and skill certificates for advisors and farmers, supported by demonstration events, and establish a structured regulatory feedback loop by publishing evidence from pilots, engaging competent authorities on simplified approval pathways and supporting SMEs with targeted micro-grants for data and dossiers.	short-mid-long term	Ministries responsible for agriculture, climate and environment; monitoring and standardisation bodies; research institutions and universities; EIP Operational Group consortia; advisory and AKIS services; producer groups and cooperatives; SMEs and bio-input developers; national R&D funding agencies; certification and competent authorities	HR
9	Expansion of precision soil diagnostics and on-farm bio-inputs enablement for nutrient efficiency and resilience	Establish a national framework for precision soil diagnostics, defining harmonised testing protocols (chemical, biological and physical indicators), subsidy models and data standards, and ensuring alignment with the Nitrogen Act and integration with IACS/LPIS systems.; Pilot integrated diagnostic packages on a large number of farms, combining laboratory analyses, field mapping tools and sensors with fertilisation planning and advisory support, in order to demonstrate the added value of data-driven nutrient management.; Launch targeted investment support for small-scale on-farm fermentation and composting units as well as precision application equipment, linking financial support to the use of diagnostics and nutrient plans.; Roll out modular skill certificates and training programmes for advisors and lead farmers on precision diagnostics, safe and effective use of bio-inputs and advanced nutrient planning.;	short-mid-long term	Ministry responsible for agriculture (lead); ministries responsible for environment and industry; paying agencies; research institutions and accredited laboratories; advisory and AKIS services; producer groups and cooperatives; SMEs providing diagnostics, sensors and bio-inputs; IT partners and data service providers; national research agencies	CZ

		Scale nationwide adoption of diagnostics and bio-inputs, embedding monitoring of nutrient efficiency, mineral fertiliser reduction and yield stability into CAP monitoring and agri-environmental reporting systems.			

Climate & environmental sustainability - from compliance to performance

Climate neutrality and environmental sustainability are core ambitions of the circular bioeconomy. This pillar focuses on result-based and performance-oriented CAP measures that reward farmers for delivering measurable ecosystem services — carbon sequestration, soil health improvement, water efficiency, and biodiversity restoration.

Circular and regenerative practices such as carbon farming, nutrient recycling, and agroforestry enhance both mitigation and adaptation outcomes. Digital MRV systems provide the data backbone for tracking environmental results, linking payments directly to verified outcomes.

Integrating climate-smart measures into CAP ensures that environmental goals become economic opportunities, positioning farmers as active contributors to the EU's 2040 and 2050 climate targets.

Selected policy measures and implementation pathways (table below)

No.	Policy measure	Steps to delivery	Timeframe	Responsible type of actor	BIOEAST relevance country
1	Result-based reduction of GHG emissions in biofuel feedstock crops through regenerative practices and residue-to-biogas systems	Develop and standardise a national methodology for farm-level GHG accounting (kg CO_2e/ha), including soil organic carbon (SOC) proxies, residue management indicators and full alignment with RED III and national climate/energy reporting requirements.; Design a result-based eco-scheme payment logic with eligibility rules linking €/ha payments to verified emission reductions, complemented by a standard-cost fallback and safeguards against double funding.; Pilot the eco-scheme in selected arable regions (e.g. rapeseed and maize systems in manure-surplus and drought-prone districts), testing monitoring approaches and operational linkages between crop residues and biogas value chains.;	Short-mid (methodology design, pilots and capacity-building 2026-2027), followed by long-term implementation, scaling and monitoring (2028-2034)	Ministry responsible for agriculture (lead); paying agencies; research institutions in agriculture; national emissions, climate and environmental protection bodies; energy regulatory authorities; AKIS and advisory services; universities; regional agricultural chambers; biofuel and bioenergy	PL

		Develop and deploy AKIS-based knowledge-transfer and advisory modules (precision nitrogen management, low-emission fertilisation, cover crops, crop rotations, digestate use), supported by digital tools and targeted training for advisors and farmers.; Launch a nationwide CAP Pillar I eco-scheme with tiered, result-based payments and a temporary top-up for baseline testing and farm-level planning.; Complement Pillar I with Pillar II agri-environment-climate interventions and cooperation measures supporting advanced regenerative practices, SOC monitoring, biogas integration and climate-adaptation actions.; Establish a robust annual monitoring, reporting and verification (MRV) system using digital farm logs, remote sensing and RED sustainability audits, ensuring consistent national reporting to the European Commission.		organisations; IT and digital-infrastructure providers	
2	Expansion of perennial biomass and fruit plantations delivering carbon, water and cascading feedstock benefits	Develop a national eligibility list and technical guidance for perennial biomass and fruit species (industrial, energy and fruit crops), defining soil-carbon, water-retention and erosion-control benefits, cascading-use suitability (material uses before energy) and biodiversity safeguards.; Pilot the establishment of perennial systems in erosion-prone and drought-affected districts (≥40,000 ha by 2027), combining plantations with water-retention micro-works, permanent soil cover protocols and advisory support.; Launch full result-based agri-environment-climate (AECM) contracts under CAP Pillar II, with tiered payments (e.g. 100–220 €/ha) linked to verified ecosystem outcomes (SOC gains, erosion risk reduction, water retention), complemented by capped establishment grants (≤65%) differentiated by species and site conditions.; Integrate perennial biomass and fruit flows into cascading bioeconomy value chains through long-term supply contracts, prioritising material-grade uses (e.g. bioplastics, biochemicals, fibre applications), while directing only processing residues to energy uses.;	short-mid (framework design and pilots 2026–2027), followed by long-term implementation, integration and monitoring (2028–2034)	Ministries responsible for agriculture (lead) and environment; paying and agriculture modernisation agencies; research institutes and universities; producer groups and cooperatives; advisory and AKIS services; regional and local authorities; bioeconomy hubs; SMEs and biorefineries; statistical and monitoring bodies; civil-society and bioeconomy coordination platforms	PL, CZ

		Establish a harmonised monitoring and evaluation framework tracking ecosystem outcomes and feedstock flows (ΔSOC, infiltration and erosion indices, hectares established, tonnes contracted into cascading uses), with annual reporting feeding into CAP monitoring and bioeconomy strategy implementation.			
3	Result-based carbon farming with organic amendments (digestate, biochar, compost)	Develop national certification rules for digestate, biochar, and compost, including quality standards, contamination thresholds, and SOC stability factors for payments.; Pilot agri-environment-climate contracts on farms with low-SOC soils to test protocols for SOC baseline monitoring and contamination audits.; Establish lab and advisory capacity for SOC testing and nutrient-carbon planning, integrated with AKIS training modules.; Scale payments for verified SOC gains to ≥180k ha, linked to amendment producers for supply security.; Integrate digital MRV tools (soil sensors, dashboards) to reduce verification costs and ensure transparency.; Monitor and evaluate the program, adjusting payment tiers based on SOC outcomes and contamination pass rates.	Short to long-term (2026-2034)	Ministries of Agriculture, Environment; Research institutions; SZIF; ARiMR; advisory networks; producer organisations; IT providers; compost/pyrolysis plants.	PL, CZ, SI
4	Pilots for pyrolysis and compost heat-recovery with biochar/substrate QA	Identify suitable biomass streams and pilot locations and launch EIP Operational Group pilots of modular pyrolysis and composting with heat recovery, including basic emission, odour and social-acceptance protocols.; Develop national quality-assurance standards for biochar and compost/substrates (stability, contaminants, carbon index) and link certified outputs to carbon-farming AECM and substrate hubs.; Scale pilots through targeted investment support for modular lines and QA labs, connect certified outputs to field use, and monitor biomass processed, SOC potential, recovered heat and acceptance indicators.	short-mid-long term (2026-2034)	Ministries responsible for climate, environment and agriculture; research institutes and universities; standardisation and accreditation bodies; EIP consortia; regional authorities; ARiMR; SMEs; advisory and bioeconomy coordination platforms.	PL
5	Implementation of a result-based eco-scheme	Develop ecosystem service indices and valuation models (SOC, biodiversity, water retention/quality, GHG balance) aligned with CAP	short-mid-long term (2026-2034)	Ministries responsible for agriculture and environment; paying	SI

	paying for verified ecosystem services with digital MRV and AKIS support	performance indicators, and pilot digital MRV protocols using remote sensing, sensors and farm logs.; Build AKIS capacity through modular training and advisory packages for advisors and farmers, linking regenerative practices with digital monitoring and outcome-based payments.; Roll out a national result-based eco-scheme with tiered payments for verified outcomes, prioritising high-risk catchments and low-SOC areas, and operate annual monitoring and public reporting of ecosystem service results.		agencies; research institutions and universities; national soil and environmental monitoring bodies; AKIS and advisory services; IT and MRV platform providers; producer groups.	
6	Result-based eco-scheme: certified biochar & compost/digestate co-application	Establish national quality standards for biochar, compost and digestate (fixed carbon, contaminants, hygiene) and define a Stable-C Index methodology for use in CAP eco-schemes; Pilot co-application of certified amendments on arable, grassland and horticultural farms via EIP Operational Groups, using digital logs and baseline soil/water sampling; Launch a Pillar I result-based eco-scheme linked to the Stable-C Index and infiltration proxies, followed by scaling through advisory campaigns, nutrient planning tools and monitored uptake.	short-mid-long term (2026-2034)	Ministries responsible for agriculture and environment; certification and standardisation bodies; research institutions and universities; EIP consortia; paying and agriculture modernisation agencies; AKIS and advisory services; independent auditors; farmers and operators.	SI, CZ
7	National protocols, label & AKIS micro-credentials for compostables (DPP-ready)	Draft and validate national, EN-aligned test protocols for compostable agricultural inputs (performance and compostability, incl. home composting) and develop standard conformity assessment templates.; Design and launch a national compostables label supported by an open, DPP-ready registry and API, interoperable with CAP monitoring and digital MRV tools.; Roll out AKIS training with stackable micro-credentials for farmers, advisors and public authorities, complemented by buyer and procurement toolkits to drive market uptake.	short-mid-long term (2026-2034)	Ministries responsible for agriculture and digital transformation; paying agencies; standardisation and certification bodies; research institutions; AKIS and advisory services; chambers, cooperatives and SMEs; IT and registry operators; public procurers.	SI

8	Side-Stream registry & cascading valorisation pilots (cooperation + AKIS + investments)	Establish a national digital side-stream registry with open APIs and draft QA / End-of-Waste conformity templates for food-industry and agri-food residues, enabling traceability and cascading use.; Launch EIP Operational Group pilots to test cascading valorisation pathways (materials first, residuals to AD), supported by targeted investment grants for pilot processing lines (extraction, drying, QA labs, logistics).; Scale up registry coverage, certified product lines and AKIS-linked training (modular micro-credentials), embedding cascading protocols into advisory services, procurement and CAP monitoring.	short-mid-long term (2026-2034)	Ministries responsible for agriculture and environment; paying and agriculture modernisation agencies; research institutions and universities; AKIS and advisory services; chambers and cooperatives; SMEs and processors; registry and IT operators; local action groups.	SI, CZ
9	Circular investment blending facility for bioeconomy SMEs	Design a national blended-finance facility pooling CAP Pillar II investments, Cohesion Funds (ERDF/CF) and EIB/EIF instruments, with agreed governance, risk-sharing rules and environmental eligibility criteria.; Launch pilot blended calls for circular bioeconomy SMEs (e.g. waste valorisation, biomaterials, on-farm and rural renewable energy), combining grants, guarantees and loans.; Scale the facility to national coverage with monitoring KPIs, guarantee schemes and regional branches supporting SME uptake and portfolio performance.	short-mid-long term (design 2026-2027; pilots 2027-2028; scale-up 2029-2034)	Ministries responsible for agriculture, finance, economy and environment; national development and enterprise funds; paying and agriculture modernisation agencies; European Investment Bank / EIF; national banks and green finance institutions.	SI
10	Soil health bonds (green finance)	Design and pilot a Soil Health Bond instrument with ministries of agriculture and finance and a public financing provider, earmarking proceeds for soil-health AECMs and nutrient-management pilots.; Define and validate monitoring indicators (e.g. SOC increase, erosion control, nutrient balance) that link verified outcomes to bond performance and payouts.; Issue initial bonds with partial EU/EIB guarantees, allocate proceeds to CAP eco-schemes and AECMs, and scale issuance to multi-regional coverage.	short-mid-long term (design 2026-2027; issuance 2027-2028; allocation and scale-up 2028-2034)	Ministries responsible for agriculture and finance; public financing providers; European Investment Bank / EIF; national R&D funding agencies; research institutions and certification bodies; agriculture modernisation units; chambers of agriculture.	HU, SI
11	Adoption of result-based soil-biology practices	Define a composite Soil Health Score (SOC, infiltration/aggregate stability, microbial proxy) and harmonised baseline testing protocols, aligned with CAP agri-environment-climate requirements.;	short-mid-long term (preparation	Ministries responsible for agriculture and environment; paying	CZ, SK

	with support for regenerative techniques and bio-based products	Pilot result-based AECM contracts in erosion- and drought-prone zones to test payments linked to soil-biology improvements, supported by advisory packages on regenerative practices and bio-based inputs.; Roll out a national result-based AECM scheme with tiered payments linked to verified Soil Health Score gains, supported by annual monitoring via IACS/LPIS, lab tests and digital farm logs.	and pilots 2026-2027; national implementation and monitoring 2028-2034)	agencies; research institutions and national soil hubs; advisory and AKIS services; producer groups and chambers of agriculture; statistical offices and IT providers.	
12	Mixed crop-livestock and agroforestry transitions with result-based outcomes and establishment support	Identify priority regions and farming systems with high erosion/drought risk and low integration of mixed crop-livestock or agroforestry systems, and pilot result-based AECM contracts using an Agro-Resilience Index (SOC change, soil cover/erosion, microclimate, nitrogen balance).; Provide targeted establishment support for agroforestry elements and mixed systems (tree rows, fencing, watering points, housing upgrades) combined with advisory support and monitoring protocols.; Scale outcome-based AECM payments and integrate value-chain linkages, channeling agroforestry biomass into cascading uses and closing nutrient loops through manure and digestate hubs.	short-mid-long term (mapping and pilots 2026-2027; establishment support 2026-2028; scaling, integration and monitoring 2028-2034)	Ministries responsible for agriculture and environment; paying and agriculture modernisation agencies; research institutions and universities; advisory and AKIS services; regional and local authorities; producer groups and cooperatives; biomass hubs and SMEs.	CZ, SK
13	Regional hemp-wool micro-factories & QA for soil-returnable panels	Develop national technical guidance and quality-assurance criteria for hemp-wool insulation panels, covering compostability/soil return, thermal and acoustic performance, and compliance with building standards; Launch CAP Pillar II investment calls to establish regional hemp-wool micro-factories, including processing equipment, QA laboratories and short logistics chains, embedded in regional bioeconomy hubs.	short-mid term (preparation 2026-2027; investments and rollout 2027-2028)	Ministries responsible for agriculture and regional development; research institutions and universities; standardisation bodies; regional authorities; SMEs and processing cooperatives.	SK
14	Regional composting & soil hub network	Map regional bio-waste streams (agricultural, municipal, food industry) and identify priority catchments, followed by piloting 2-3 integrated compost hubs linking farmers, municipalities and SMEs.; Develop and apply quality-assurance protocols for compost use in soils (nutrient value, contaminants, microplastics) and integrate certified compost flows into CAP eco-schemes and AECM targeting soil carbon, erosion control and nutrient substitution.;	short-mid-long term (mapping 2026-2027; pilots 2027-2028; integration and scaling 2028-2034)	Ministries responsible for agriculture and environment; agriculture modernisation units and paying agencies; research institutions and accredited laboratories; municipalities and Local	SK, HU

		Scale the hub network nationally by embedding compost hubs into CAP monitoring and digital reporting, achieving stable, high-volume circulation of certified compost.		Action Groups; cooperatives and SMEs; advisory and AKIS services.	
15	Green public procurement accelerator for rural schools and hospitals	Pilot green public procurement of certified bio-based products (e.g. food packaging, cleaning agents, insulation materials) in selected rural schools and hospitals to test criteria, supplier readiness and acceptance. Develop national green procurement criteria and practical toolkits tailored to rural public institutions, followed by targeted training for procurement officers and local suppliers. Scale adoption nationwide by embedding criteria into public procurement practice, while monitoring uptake, supplier participation and market impacts.	short-mid-long term (pilots 2026-2027; criteria and capacity-building 2027-2029; scaling 2029-2034)	Ministries responsible for agriculture and economy; public procurement offices; local and regional authorities; advisory and AKIS services; universities; NGOs; local entrepreneurs and SMEs.	HU
16	Deployment of a precision-enabled eco-scheme paying for verified ecosystem services with digital MRV	Develop composite ecosystem service indices and digital MRV protocols, then pilot a result-based eco-scheme using sensors, RS/GIS and dashboards in priority drought, erosion and livestock catchments.; Build advisory and training capacity through modular micro-credentials on digital MRV, ecosystem services and precision practices, and roll out a nationwide tiered eco-scheme paying only for verified outcomes.; Integrate optional links to micro-biogas and nutrient cycling where this improves GHG balance, and ensure transparent annual reporting via public dashboards.	short-mid-long term (preparation and pilots 2026-2027; national rollout and integration 2028-2034)	Ministries responsible for agriculture; paying agencies; research institutions and national soil hubs; advisory and AKIS services; universities; NGOs; producer organisations; IT and digital solution providers; statistical offices.	CZ

Sustainable agriculture, food & forestry value chains - closing loops across sectors

This pillar focuses on the transformation of agriculture, food, and forestry value chains into circular, traceable, and low-emission systems. By connecting primary production with processing and consumption, it enables resource-efficient production and fair value distribution.

Cascading use of biomass — prioritising food and feed first, followed by materials, chemicals, and energy — ensures maximum value creation from every resource. Investments in biorefineries, modular biomethane plants, circular packaging, and traceable digital food passports strengthen the material-first bioeconomy while maintaining food security.

Short supply chains, certification systems, and local processing hubs will boost consumer trust and regional competitiveness, anchoring Central Europe's transition toward a low-carbon, regenerative bio-based economy.

Selected policy measures and implementation pathways (table below):

No.	Policy measure	Steps to delivery	Timeframe	Responsible type of actor	BIOEAST relevance country
1	Deployment of agricultural biogas and biomethane solutions for residues and manures with nutrient recycling and climate benefits	Develop national sustainability guidelines for feedstock use and digestate quality, and design investment and financing models for on-farm and cluster-scale AD/biomethane plants.; Pilot cooperation models under EIP for feedstock logistics and nutrient recycling, followed by large-scale Pillar II investments in digestion, upgrading, storage and heat recovery.; Establish a national monitoring framework covering avoided GHG emissions, nutrient recycling performance and local socio-economic benefits, integrated with CAP reporting.	short-mid-long term (preparation and pilots 2026-2027; rollout and scaling 2028-2034)	Ministries responsible for agriculture and environment; paying agencies; research institutions and universities; producer associations and cooperatives; Local Action Groups; advisory and AKIS services; national and regional financing institutions; statistical and monitoring bodies.	PL, CZ
2	Deployment of regional biorefineries and fermentation pilots for PHA, PLA and green solvents based on agricultural residues	Establish a national framework and regional calls for biorefinery pilots, defining eligibility, cascading-use rules, sustainable biomass sourcing criteria and monitoring requirements.; Launch and scale fermentation and enzymatic pilot lines valorising agri-food residues, supported by CAPEX and milestone-based funding to progress from pilot to early market uptake.; Expand regional demonstrators with advisory and training support, and implement a transparent monitoring system covering residue valorisation volumes, bio-based outputs and fossil substitution impacts.	short-mid-long term (preparation and pilots 2026-2027; implementation and scaling 2028-2034)	National R&D and innovation funding agencies; Horizon Europe National Contact Points; ministries responsible for agriculture and economy; paying agencies; research institutes and universities; advisory and AKIS services; regional authorities; financing institutions.	PL

3	Facilitate the deployment of a national digital food passport & traceability system (DPP-ready) to strengthen trust, value capture and sustainability verification in agri-food chains	Develop a national Digital Product Passport (DPP) framework and open, API-based data schema aligned with EU standards, covering compliance, quality and sustainability information.; Pilot DPP data flows in selected agri-food value chains through EIP Operational Groups, then launch a national repository and onboarding portal supported by SME micro-grants for integration.; Roll out training for advisors, SMEs and retailers, and scale passportisation with continuous monitoring of coverage, data quality and consumer uptake.	short-mid-long term	Ministries responsible for agriculture and digital transformation; paying agencies and national support centres; research institutions and universities; IT public bodies and service providers; EIP consortia; advisory and AKIS services; producer groups, cooperatives, retailers; certification bodies.	PL, SI
4	Eco-scheme for agrotourism ecosystem services	Design a CAP eco-scheme payment logic rewarding agrotourism services that maintain landscapes, biodiversity features and cultural heritage, with clear eligibility and safeguards.; Pilot the scheme in Natura 2000 and rural heritage areas, develop a light monitoring framework (visitor satisfaction, biodiversity and cultural-service proxies), and train advisors and Local Action Groups on onboarding.; Scale up nationally by integrating the scheme into CAP eco-schemes and monitoring systems, targeting wide uptake by farms providing ecosystem-based tourism services.	short-mid-long term	Ministries responsible for agriculture, rural development and tourism; paying agencies; local governments and Local Action Groups; research institutions and universities; advisory and AKIS services; agricultural chambers; rural tourism organisations; NGOs and environmental authorities.	PL
5	Cooperation for lignocellulosic biomass cascading into high-value bioproducts through regional hubs and value-chain contracts	Conduct national and regional mapping of agricultural and forest lignocellulosic biomass (residues, perennials), identify logistics bottlenecks, and pilot EIP-based cascading hubs testing drying, fractionation and QA under material-first principles.; Develop standard long-term supply contracts and quality protocols linking farms, forest owners and hubs, and roll out CAP investment support for regional cascading infrastructure (pre-processing, storage, QA, logistics).; Scale mobilisation through value-chain contracts feeding biopolymer and biochemical lines, with annual monitoring of cascading performance and climate substitution effects.	short-mid-long term	Ministry of agriculture; forest services; research institutions and universities; EIP Operational Group consortia; cooperatives and producer/forest associations; SMEs and bioproduct processors; advisory and AKIS services; regional authorities; environmental agencies.	SI

6	Livestock modernisation and flexible biogas at point of use	Identify priority livestock clusters with manure surplus and nearby energy users, and pilot siting, odour and welfare protocols through EIP Operational Groups.; Roll out CAP investment support for housing modernisation (nutrient capture, odour control) and flexible, farm/cluster-scale biogas units with high on-site energy use.; Integrate digestate into carbon-farming and nutrient AECMs, supported by certified logistics protocols and continuous monitoring of performance and social acceptance.	short-mid-long term	Ministry of agriculture; environmental authorities; paying and agriculture modernisation agencies; research institutions; EIP Operational Group consortia; producer groups and cooperatives; municipalities; advisory and AKIS services; SMEs and technology suppliers; environmental monitoring bodies.	SI, CZ
7	Farm & Cluster Biogas/Biomethane with Digestate Circularity	Establish national digestate quality standards and permitting guidance (metals, microplastics, hygiene), including mandatory heat-use planning, and pilot feedstock logistics and siting through EIP Operational Groups.; Launch CAP Pillar II investment grants with performance-based contracts for farm- and cluster-scale biogas/biomethane plants, integrating short-haul logistics and odour mitigation.; Embed digestate use into CAP nutrient planning, eco-schemes and AECMs, and scale up with digital monitoring of heat use and mineral nutrient substitution.	short-mid-long term	Paying agency and agriculture modernisation units; ministries responsible for agriculture and environment; research institutions; EIP Operational Group consortia; certification bodies and inspectorates; advisory services; regional authorities; biogas/biomethane operators.	SI
8	National biochar guidelines, certification & AKIS micro-credentials	Develop and consult national biochar application guidelines, covering quality thresholds, safe and co-application rules, and standard MRV templates, and validate them through EIP Operational Group pilots.; Establish a national biochar registry and helpdesk under CAP Technical Assistance to manage certification templates, protocols and advisory queries.; Roll out AKIS training with modular micro-credentials for advisors, farmers and municipal staff, and scale adoption through certified protocols and monitored uptake.	short-mid-long term	Ministries responsible for agriculture and environment; paying agency; research institutions; certification bodies; EIP Operational Group consortia; advisory services and farmer organisations; regional authorities; chambers of commerce.	SI
9	Development of enabling framework	Prepare a national biomethane roadmap covering regulatory adjustments, grid adaptation, sustainability safeguards, digestate	short-mid-long term	Ministries responsible for agriculture, environment	SK, CZ

	and pilot investments for farm and cluster biomethane with digestate circularity	quality standards and mandatory heat-use requirements, aligned with RED III and national energy strategies.; Launch pilot and demonstration projects (farm- and cluster-scale) combining anaerobic digestion, biomethane upgrading, local heat use and certified digestate application, supported by CAP investment instruments.; Establish a stable market framework (e.g. guarantees of origin, feed-in mechanisms, contracts with transport/industry) and scale up biomethane plants in manure-surplus regions, integrating digestate into CAP nutrient planning.		and energy; energy regulatory office; gas operators; national and regional energy agencies; paying and agriculture modernisation agencies; research institutions; producer groups, cooperatives and SMEs; advisory services.	
10	Regional carbon farming living labs	Select 4–5 representative regions (different soil and climate conditions) and establish Carbon Farming Living Labs as multi-actor platforms linking farmers, advisors, SMEs and researchers.; Co-design and test carbon-farming practices in real farm conditions, integrating basic monitoring of soil carbon, biodiversity and water retention together with farm-level economic assessment.; Institutionalise Living Labs as permanent regional innovation and advisory nodes, feeding results into AKIS, CAP eco-schemes/AECMs and national carbon-farming strategies.	short-mid-long term	Ministry of agriculture; research institutions and universities; regional authorities and hubs; farmer organisations and chambers; advisory services; NGOs; innovation authorities.	SK, HU
11	Circular manure exchange platform	Develop and pilot a national GIS-based digital platform to match manure/digestate surpluses with nutrient-deficit areas, starting in high-livestock regions.; Integrate the platform with CAP nutrient planning tools (eco-schemes/AECM) and apply standard logistics and quality-assurance protocols (storage, transport, odour, hygiene).; Scale nationwide as a permanent coordination and monitoring system, enabling large-scale nutrient redistribution and verified reductions in mineral fertiliser use.	short-mid-long term	Ministry of agriculture; agriculture modernisation units; research institutions; advisory services and chambers of agriculture; municipalities; IT platform operators; inspectorates.	HU
12	Local biogas from waste biomass with on-site energy use and odour control	Identify priority clusters with high availability of waste biomass and local heat/electricity demand, and pilot EIP projects on siting, short-haul logistics and odour-abatement protocols.;	short-mid-long term	Ministry of agriculture; ministry responsible for environment; regional and local authorities; paying/agriculture	CZ

		Provide targeted CAP Pillar II investment support for farm/municipal AD units with on-site energy use (CHP/heat networks), digestate storage/processing and best-available odour control.; Integrate digestate into result-based AECMs (carbon farming, nutrient substitution) and ensure transparent community engagement, monitoring of odour complaints and performance-based adjustments.		modernisation agencies; research institutions; advisory services; producer groups and cooperatives; SMEs; local action groups; energy regulators.	

Rural communities & regional bioeconomy hubs – empowering local transformation

Rural communities are at the heart of the bioeconomy transition. Establishing regional bioeconomy hubs connects local actors — farmers, SMEs, municipalities, and research institutions — to create territorial ecosystems for innovation, value creation, and nutrient circularity.

These hubs integrate physical infrastructures (micro-biogas plants, biomass mobilisation hubs, compost and digestate systems) with institutional cooperation networks (LEADER, EIP, and digital provenance tools).

They promote local entrepreneurship, decentralised renewable energy, and social acceptance while ensuring that economic value stays within the region. In Central Europe, this approach revitalises rural areas, enhances circular business models, and strengthens social cohesion across communities.

Selected policy measures and implementation pathways (table below):

No.	Policy measure	Steps to delivery	Timeframe	Responsible type of actor	BIOEAST relevance country
1	Organisation of biomass mobilisation and regional feedstock hubs for high-value material-grade uses	Conduct regional biomass mapping to identify priority residues/side-streams and pilot 5–7 feedstock hubs testing segregation, drying, fractionation, QA and digital traceability.; Develop standard farm–hub contracts and quality protocols ensuring cascading priority (material uses before energy) and compliance with waste and OSH rules.; Roll out CAP Pillar II investment support for regional hubs (≤65% CAPEX) and scale long-term farm–hub contracts to stabilise material-grade biomass supply.	short-mid-long term	Ministry of agriculture; regional authorities; paying/agriculture modernisation agencies; research institutions and universities; cooperatives and producer groups; Local Action Groups; SMEs (logistics, pre-processing); advisory services; standardisation and inspection bodies.	PL, SI, HR, CZ

2	Facilitate the creation of trusted short supply chains and local partnerships using digital provenance tools to improve margins, reduce waste and strengthen consumer trust	Design a national framework for digitally enabled short supply chains, integrating Digital Product Passport (DPP) layers (compliance, quality, culinary) and standard cooperation call templates.; Launch and test EIP and LEADER pilot partnerships (farmer-processor-logistics-retail/HORECA) using shared storefronts, pooled logistics and digital provenance/storytelling tools.; Scale successful models nationally, embedding smart labels and e-commerce data to monitor price premiums, waste reduction and consumer trust.	short-mid-long term	monitoring/agriculture modernisation agencies; ministries responsible for agriculture and regional development; research institutions and universities; advisory and AKIS bodies; GS1/product identification systems; producer groups, cooperatives and Local Action Groups; SMEs (logistics, IT, marketing); retailers/HORECA; certification bodies.	PL, SK, CZ
3	AKIS living labs, diagnostics & micro-credentials for regenerative transition	Co-design a national soil-health diagnostic toolkit and benchmarking registry, covering basic soil cover, infiltration and SOC/biology indicators, aligned with CAP monitoring.; Establish AKIS living labs with demo farms and peer-learning groups in priority erosion and drought regions, linking advisors, researchers and farmer groups.; Roll out micro-credential training for farmers and advisors and integrate digital diagnostics and benchmarking tools into advisory services and CAP reporting.	short-mid-long term	ministries responsible for agriculture and environment; research institutions and universities/labs; advisory services providers (AKIS); Central and Regional Advisory Centres; farmer groups, cooperatives and chambers; paying agencies and CAP monitoring bodies.	PL, CZ, SK
4	Establishment of micro-biogas plants and circular manure hubs through LEADER/EIP cooperation for local nutrient cycling and social acceptance	Develop national guidelines for micro-biogas hubs, covering modular AD units, simplified digestate handling, odour and leachate safeguards, and streamlined environmental screening.; Launch LEADER/EIP pilot projects (≥30 hubs) in manure- and biomass-surplus areas, combined with local training, information meetings and community engagement.; Scale up shared hub models with common logistics and integrate them into local circular economy and nutrient recycling plans, supported by annual performance and acceptance monitoring.	short-mid-long term	ministries responsible for agriculture and environment; paying and monitoring agencies; Local Action Groups (LEADER); producer organisations and cooperatives; municipalities; advisory services and chambers of agriculture; EIP Operational Group consortia; public and development banks.	SI

5	Sectoral (fruit & vegetables POs): circular packaging & by-product certification + AKIS micro-credentials	Integrate circular packaging and by-product certification actions into recognised Fruit & Vegetable Producer Organisations' (POs) operational programmes, with clear protocols, open eligibility criteria and training requirements.; Launch EIP pilots with POs and SMEs to validate fibre-based packaging, residue-derived ingredients and DPP-ready templates, combined with first AKIS micro-credential modules.; Scale certification, labelling and digital registries, embedding circular packaging and green procurement criteria across PO programmes and sectoral schemes.	short-mid-long term	ministries responsible for agriculture and digitalisation; paying agencies; Fruit & Vegetable Producer Organisations; research institutions and universities; chambers of agriculture; cooperatives and processing SMEs; EIP Operational Group consortia; certification and standardisation bodies.	SI
6	Engineered wood & biorefinery pilots with CHP + biochar return	Identify candidate SMEs, forest-owner groups and municipalities; map low-grade hardwood supply and prepare feasibility studies for integrated engineered-wood/biorefinery lines with CHP and biochar return.; Launch EIP pilot lines (e.g. LVL/CLT incl. hardwoods, wood modification, extractives) with on-site CHP and biochar production, supported by QA/testing labs and advisory integration.; Develop national QA and certification protocols for engineered wood and biochar, train operators via AKIS micro-credentials, and scale investments into market-ready, compliant value chains.	short-mid-long term	ministries responsible for agriculture, forestry and environment; forest services; paying agencies; research institutes and universities; EIP Operational Group consortia; advisory services; SMEs and processors; certification and standardisation bodies; public and development banks.	SI
7	Digital farmer wallet for eco-scheme tracking	Develop a digital farmer wallet linked to IACS/LPIS that records eco-scheme participation and issues verifiable digital eco-credits at parcel level.; Pilot the wallet in 2–3 regions via EIP Operational Groups, testing usability, data flows and advisory support for farmers and cooperatives.; Integrate the wallet with carbon/eco-credit platforms and cooperative schemes, then scale nationwide to enable transparent reporting and optional credit trading.	short-mid-long term	ministries responsible for agriculture and public administration; paying agency (IACS/LPIS); GovTech/digital agencies; environmental data authorities; research institutions and IT developers; cooperatives and producer organisations; advisory services (AKIS).	SI

8	Eco-scheme for crop diversification & local protein sources	Define and validate monitoring indicators (share of protein crops, rotation diversity index) and integrate them into LPIS/IACS and digital farm logs for eco-scheme control.; Pilot result-based eco-scheme contracts with farms in selected regions, supported by advisory services, producer groups and EIP Operational Groups.; Develop digital log templates and field-verifier protocols to ensure harmonised reporting, controls and interoperability with CAP monitoring systems.; Integrate the scheme into the national protein strategy and CAP eco-scheme menu, ensuring policy coherence and long-term budget allocation.; Scale uptake nationally to exceed 300,000 ha and achieve at least 20% substitution of imported mineral protein by 2034, monitored through CAP performance indicators.	short-mid-long term (2026-2034)	Ministry of Agriculture (lead); Ministry of Finance; paying agency (LPIS/IACS); research institutions and universities; advisory services (AKIS); producer groups and cooperatives; seed companies and gene banks; SMEs; IT providers; EIP consortia.	SI, HU, CZ
9	Result-based eco-scheme: certified bio-fertilisers with precision application	Develop and approve a national certification list and QA protocols for bio-fertilisers and biostimulants, defining safety, nutrient-content thresholds and eligibility for CAP eco-schemes.; Design harmonised digital MRV templates and farm logbook standards for precision application, including variable-rate use, decision-support records and invoice-based evidence.; Pilot the result-based eco-scheme through EIP Operational Groups and demo farms to validate the N-Substitution & Soil-Benefit Index linking mineral N reduction with soil-health proxies.; Launch the national roll-out of the eco-scheme with digital onboarding and one-off baseline soil and management tests to ensure robust result-based payments.; Scale uptake nationally to at least 280,000 ha by 2030, achieving on average a minimum 18% reduction in mineral nitrogen use with verified soil-health improvements.	short-mid-long term (2026-2034)	agriculture modernisation units; research institutions in agriculture; plant protection and seed inspection services; certification bodies; advisory services (AKIS); farmers and producer groups; SMEs; IT providers; EIP consortia.	CZ, SK
10	Establish regional bioeconomy hubs and value-chain cooperation to supply material-	Develop national guidance on cascading hierarchy and hub eligibility, clearly prioritising material uses over energy, with quality-assurance criteria and compliance with waste, food and feed legislation.;	short-mid-long term (2026-2034)	Monitoring agency (lead); agriculture modernisation units; regional governments; research institutions in agriculture;	CZ

	grade feedstock for cascades before energy use	Launch EIP Operational Group pilots to map regional supply, test pre-processing options such as drying and fractionation, and establish long-term contracts between farms, cooperatives and SMEs.; Deploy CAP Pillar II investment calls to equip regional hubs with laboratories, QA systems, storage and logistics infrastructure under regional authority coordination.; Integrate certified material-grade feedstock flows into CAP reporting systems, linking volumes with eco-schemes and AECM outcomes on nutrient cycling and circularity.; Scale the model to at least 25 regional hubs supplying a minimum of 250 kt/year of certified material-grade biomass, with systematic monitoring of logistics losses, SME participation and new product lines.		universities; advisory services (AKIS); farmers and cooperatives; SMEs; EIP consortia; hub operators.	

Knowledge & skills for farmers and advisors – enabling lifelong learning and innovation

Human capital is the engine of bioeconomy implementation. Farmers and advisors need new competences to manage circular, digital, and regenerative systems.

The CAP's knowledge exchange and advisory frameworks provide the foundation for lifelong learning, modular certification, and innovation brokerage. Micro-credentials, e-learning platforms, and bioeconomy fellowships help professionalise advisory services and align training with emerging technologies and sustainability goals.

Strengthened AKIS coordination ensures that innovation is demand-driven and inclusive, empowering farmers to apply precision and circular practices effectively. Investing in knowledge and skills means investing in the capacity of rural actors to deliver on Europe's sustainability ambitions.

Selected policy measures and implementation pathways (table below):

No.	Policy measure	Steps to delivery	Timeframe	Responsible type of actor	BIOEAST relevance country
1	Development of modular skill certificates and innovation brokerage services to strengthen AKIS capacity for the bioeconomy	Establish a nationally recognised system of modular skill certificates aligned with AKIS and bioeconomy priorities, combined with innovation brokerage that connects farmers, SMEs and public buyers.' Pilot the system through advisory centres and EIP-style cooperation, then scale it via regional hubs and blended learning formats.; Ensure continuous feedback and evaluation to confirm uptake, skills application and effective matchmaking across value chains.	short-mid-long term (2026–2034)	Ministry of Agriculture (lead); Ministry of Education; advisory services and AKIS networks; research institutions and universities; innovation support centres; producer organisations and agricultural chambers;	PL, SI, HR

				Local Action Groups and EIP Operational Groups.	
2	AKIS modular skill certificates & bioeconomy coordination for lifelong learning (LLL)	Co-design modular, practice-oriented skill certificates for the bioeconomy with universities, advisory services, farmers and SMEs, and register them in a national digital credential system aligned with EU LLL frameworks.; Pilot certificates through EIP-style innovation projects, demo farms and SME placements, then scale delivery via AKIS and advisory networks with mutual recognition across regions.; Complement skills delivery with a permanent coordination platform linking AKIS actors and ministries, ensuring evidence-based policy feedback and countering misinformation.	short-mid-long term (2026-2034)	Ministry of Agriculture (lead); research institutions and universities; educational research institutes; AKIS and advisory services; innovation support centres; producer organisations and agricultural chambers; EIP Operational Groups.	PL
3	National fund for on-farm renewable energy self-sufficiency	Design a dedicated national investment scheme supporting on-farm renewable energy systems (PV, heat pumps, small wind) tailored to different farm types and energy profiles.; Pilot integrated installations on mixed farms, supported by advisory energy audits linking renewable generation with farm operations and CAP climate objectives.; Embed simple monitoring of energy self-sufficiency and GHG reductions into CAP reporting, then scale the scheme nationally based on verified performance and farmer uptake.	short-mid-long term (2026-2034)	Ministry of Agriculture (lead); Ministry of Energy/Climate; national environmental and public financing institutions; paying agency and agriculture modernisation units; research institutions; advisory services (AKIS); agricultural chambers; producer groups; NGOs/bioeconomy hubs.	PL, HU
4	Bioeconomy fellowships for young farmers	Design a national fellowship programme linking universities with innovative circular farms and bioeconomy SMEs, focused on practical learning and real business challenges. Launch pilot cohorts in key bioeconomy themes, combining academic input with structured on-farm or SME placements and skills evaluation. Expand the programme with international mobility and start-up incubation pathways, then scale it nationally based on verified employment, succession and entrepreneurship outcomes.	short-mid-long term (2026-2034)	Ministry of Agriculture (lead); Ministry of Education/Science; universities and research institutions; paying and modernisation agencies; advisory services (AKIS); agricultural chambers; producer groups; innovation centres and incubators; NGOs and bioeconomy hubs	PL, HU
5	Eco-scheme for hedgerows & buffer strips with carbon	Define a concise set of result-based indicators for hedgerows and buffer strips, covering soil carbon, erosion control, water protection	short-mid-long term (2026-2034)	Ministry of Agriculture (lead); paying agency; research institutions and	SI

	and water co-benefits	and biodiversity, and translate them into simple eco-scheme contract rules. Pilot the scheme in erosion- and biodiversity-priority regions to test monitoring, advisory support and farmer uptake. Align methodologies with CRCF requirements for carbon removals and integrate them into CAP control and LPIS systems. Roll out the eco-scheme nationally with routine audits, advisory backing and adaptive updates based on monitoring results.		universities; environmental agency; advisory services (AKIS); farmers, cooperatives and producer groups.	
6	Biomethane pilots and digestate circularity (investments and cooperation)	Establish a clear legal and regulatory framework for biomethane, covering grid injection, guarantees of origin, permitting and digestate quality and classification. Launch a small number of demonstration biomethane pilots building on existing biogas plants, combined with robust digestate quality assurance and nutrient planning. Develop cooperation models for short-haul feedstock logistics and digestate use through farmer–processor partnerships and EIP-style collaboration. Scale up capacity under CAP investments while embedding digestate circularity into advisory services, eco-schemes and monitoring systems.	short–mid–long term (2026–2034)	Ministry of Agriculture (lead); Ministry of Environment; energy regulatory authority; paying and agriculture modernisation units; research institutions and universities; advisory services (AKIS); farmers, cooperatives and plant operators.	CZ

FUTURE PROJECTIONS

The Future Shape of the EU Common Agricultural Policy (CAP) after 2027

The forthcoming reform of the EU Common Agricultural Policy (CAP) will take place against the backdrop of profound social, economic and environmental transformation. While remaining anchored in its core objectives—food security, market stability, farm income support and productivity—the CAP has progressively evolved into a broader policy framework addressing rural development, environmental protection, climate action, animal welfare and product quality.

Strategic vision for EU agriculture and food systems

The long-term vision for EU agriculture and food systems towards 2040 focuses on food security and sovereignty, competitiveness, sustainability and vibrant rural areas. Key priorities include generational renewal, fair competition, market stabilisation and reduced dependency on imported inputs, particularly fertilisers and plant-based proteins. The CAP is expected to remain a cornerstone EU policy, supported by strong policy coordination and novel "rural proofing" mechanisms, underpinned by consistent funding.

EU budget and financial architecture 2028-2034

The next Multiannual Financial Framework (MFF 2028–2034) will introduce a restructured budget architecture based on National and Regional Partnership Plans (NRPPs), integrating agriculture, cohesion, fisheries and social policies at Member State level. Innovation and competitiveness will continue to be driven by Horizon Europe and the European Competitiveness Fund, with a strong focus on green transition, decarbonisation, digitalisation, resilience, biotechnology and the bioeconomy. Approximately 43% of EU expenditure is expected to be dedicated to climate and environmental objectives, reinforcing the strategic alignment between CAP instruments and bioeconomy policy goals.

New CAP architecture and policy orientation

Under the proposed framework, the CAP will move beyond the traditional two-pillar structure, forming a dedicated chapter within each NRPP. Income support, environmental actions and rural development measures will be integrated into a single strategic framework. Eligible interventions will include income support (with degressivity and capping), agri-environment-climate measures, investment support, risk management tools, support for young and new farmers, and crisis response mechanisms. Measures such as LEADER, cooperation and knowledge exchange will continue, but with increased flexibility for national allocation. Post-2027 CAP implementation will emphasise performance-based management, simplification and strategic targeting. Support will be increasingly directed towards active farmers contributing to food security, climate resilience and sustainable land management. Social conditionality and updated Good Agricultural and Environmental Conditions (GAEC) will be consolidated under a strengthened "Farm Stewardship" framework.

Implications for bioeconomy-related action

The reformed CAP, combined with the new EU financial architecture, provides a coherent and flexible framework for mainstreaming bioeconomy measures at national and regional levels. Priorities such as

circular resource use, biobased value chains, carbon farming, innovation uptake and knowledge transfer align closely with competitiveness, sustainability and rural vitality. In this context, the Action Plan builds on the forthcoming CAP reform to support innovation ecosystems, multi-actor cooperation and investment in sustainable, biobased solutions that enhance the agriculture and rural resilience in Central Europe.

CAP Vision Document – Key Insights Related to the Bioeconomy

Bioeconomy as a strategic framework for EU agriculture and food systems

Although no single, uniform definition of the bioeconomy exists, EU policy documents consistently frame it as a sustainable, circular and competitive system based on renewable biological resources, ecosystem services and innovation. The bioeconomy encompasses primary production (agriculture, forestry, fisheries), biomass-based industries, food systems, bio-based products, energy and services, while placing sustainability, circularity and biodiversity protection at its core.

Across EU strategies, the bioeconomy is increasingly recognised as an enabler of the green transition, supporting decarbonisation, reduced dependency on fossil and imported inputs, improved resource efficiency and rural job creation. These principles strongly overlap with the objectives of the EU Agri-food Vision 2040 and the evolving Common Agricultural Policy (CAP).

EU bioeconomy policy landscape

Since 2012, the EU has actively supported bioeconomy development through dedicated strategies and action plans. The EU Bioeconomy Strategy (2012, updated in 2018) defines five core objectives: food and nutrition security, sustainable resource management, reduced dependence on non-renewable resources, climate mitigation and adaptation, and competitiveness and employment.

The 2018 Bioeconomy Action Plan operationalises these objectives through three clusters:

- scaling up bio-based sectors and markets,
- deploying local bioeconomies across Europe, and
- strengthening knowledge, monitoring and ecological boundaries.

An updated EU Bioeconomy Strategy is expected by the end of 2025, reinforcing the relevance of bioeconomy measures within CAP and other EU funding frameworks. At national level, bioeconomy governance remains heterogeneous: while several Member States have adopted dedicated bioeconomy strategies, others (including Poland) are still developing or embedding bioeconomy actions within sectoral policies.

Bioeconomy sectors and the central role of agriculture

The EU bioeconomy spans multiple sectors, including agriculture, forestry, fisheries, food processing, wood products, paper, bio-based chemicals, textiles and bioenergy. Among these, agriculture and food are the core bioeconomy sectors, accounting for approximately 77% of employment and 63% of value added in EU biomass-producing and converting sectors (EU-27, 2022).

Beyond food production, agriculture provides diverse biomass streams and side-products that underpin circular value chains, such as nutrient recycling, bio-based materials, energy production and ecosystem

services. This multifunctional role positions agriculture as a key entry point for implementing bioeconomy objectives through the CAP.

CAP 2023-2027 and emerging CAP 2028-2034 orientation

The CAP 2023–2027 already integrates bioeconomy-relevant goals through its ten policy objectives, notably climate action, environmental care, competitiveness, innovation, and vibrant rural areas. Implementation is channelled through national CAP Strategic Plans, allowing Member States to tailor interventions.

Looking ahead, the CAP 2028–2034 is expected to be simpler, more flexible, more targeted and more results-oriented, with stronger synergies across EU policies. Proposed elements include area-based income support, agri-environmental actions, on-farm investments, crisis management tools, and enhanced flexibility through National and Regional Partnership Plans. Emphasis will be placed on climate resilience, sustainability, risk management, innovation uptake and support for young farmers.

This evolution creates favourable conditions for embedding bioeconomy measures—such as circular nutrient management, bio-based value chains, carbon farming and innovation ecosystems—within mainstream agricultural policy.

EU Agri-food Vision 2040 and bioeconomy linkages

The EU Agri-food Vision 2040 provides a long-term strategic framework structured around four priorities: Attractiveness, Competitiveness, Future-proofing and Connection. All four priorities are directly relevant to the bioeconomy, as the agri-food sector is both a major biomass producer and a driver of rural development and innovation.

The Vision explicitly recognises the bioeconomy as a source of diversification, value creation and resilience for farmers and rural areas. It highlights opportunities for valorising residues, strengthening farmers' position in value chains, reducing strategic dependencies and creating skilled jobs in rural regions. Bioeconomy-related measures are particularly prominent under the priorities of innovation-driven attractiveness, climate-neutral future-proofing and strengthened rural connections.

Strategic reflections and implications for policy design

Across the CAP, the Agri-food Vision 2040 and EU bioeconomy strategies, several common strategic themes emerge: sustainability transitions, innovation and knowledge, diversification of income sources, inclusion of small farms and SMEs, multi-actor cooperation, and territorially tailored approaches.

At the same time, implementation faces structural challenges, including limited resource availability, the need for long-term investments, regulatory adaptation, complex governance structures and uncertainty related to external shocks. Addressing these challenges requires coherent policy mixes, stable institutional capacities and coordination across governance levels.

Overall, the evolving CAP framework, combined with the Agri-food Vision 2040, provides a strong policy foundation for advancing the circular bioeconomy. Strategic alignment, flexible implementation and integrated monitoring will be critical to translating bioeconomy ambitions into tangible benefits for farmers, value chains and rural communities.

SUPPORTING THE UPTAKE OF THE BIOECONOMY ACTION PLAN IN BIOEAST

The effective uptake of the Central European Bioeconomy Action Plan by BIOEAST member states requires a coordinated, inclusive and evidence-based approach that builds trust, ensures national ownership and aligns transnational priorities with domestic policy frameworks. The objective is not only to disseminate project results, but to embed the Action Plan into national CAP programming (2028–2034) and broader bioeconomy governance across the BIOEAST macro-region.

Policy alignment and institutional anchoring

Engagement should start with structured dialogue with ministries of agriculture, environment and innovation, supported by research institutions involved in BIOEAST. Bilateral briefings can demonstrate how the Action Plan supports the EU Vision for the CAP post-2027 and complements national bioeconomy and innovation strategies. Formal presentation and endorsement through the BIOEAST Board and Thematic Working Groups will ensure institutional recognition and continuity.

Transnational policy learning and peer exchange

BIOEAST provides a natural platform for peer learning across countries facing similar structural challenges. Transnational policy roundtables and thematic peer-learning clusters can facilitate exchange on implementation barriers, regulatory design and investment priorities. Joint foresight exercises coordinated by BIOEAST structures can translate Action Plan measures into long-term national and regional roadmaps consistent with EU climate, digital and rural development objectives.

Knowledge brokerage through AKIS and BIOEAST HUBs

The Action Plan should be operationalised through national AKIS structures, CAP networks and EIP-AGRI mechanisms. BIOEAST hubs can act as multipliers, linking farmers, advisors, researchers, SMEs and policymakers. Innovation brokerage activities should connect Action Plan priorities with funding opportunities under Horizon Europe, CBE-JU, LIFE and cohesion instruments, supporting concrete uptake and scaling.

Targeted communication and capacity building

Concise, country-specific policy briefs and thematic learning webinars can translate strategic recommendations into actionable guidance for CAP planners and advisory bodies. Visual tools such as infographics and short explanatory materials should be used to improve accessibility and support decision-making across administrative levels.

Piloting, feedback and adaptive learning

BIOEAST members should be encouraged to pilot selected Action Plan measures through CAP eco-schemes, cooperation instruments or innovation calls. Results from these pilots should feed into a structured feedback loop coordinated by BIOEAST governance bodies, allowing refinement of measures and indicators. Regular updates of the Action Plan will support a "learning-by-doing" approach.

Strategic positioning and long-term impact

Positioning the Action Plan as a collective BIOEAST contribution to EU bioeconomy and CAP post-2027 debates will strengthen the region's visibility and influence. Long-term impact requires cross-ministerial coordination and institutionalisation of the Action Plan within BIOEAST governance structures, ensuring policy continuity beyond individual projects.

In summary, engaging BIOEAST members with the Bioeconomy Action Plan relies on combining policy dialogue, knowledge brokerage and practical implementation tools. This approach enables the Action Plan to function as a living policy reference, supporting circular bioeconomy integration within the CAP and reinforcing BIOEAST's role as a macro-regional policy accelerator.