

Summary of the Breakout Session Outcomes: “Navigating Complexity – How Can ICA Further Support the Transformation of the Circular Bioeconomy?”

1. Executive Summary

The breakout session was held during the 15th ICA Rectors and Deans Forum, “*Navigating Complexity: ICA Leading the Circular Bioeconomy Transformation*” on 17 October 2025 at BOKU University in Vienna, Austria.

This summary brings together the key insights from the ICA breakout session, which focused on **how ICA and its member institutions can overcome barriers, support competence development, and strengthen collaboration** to accelerate Europe’s transition toward a circular bioeconomy. Participants stressed the importance of simplifying complexity, embedding circular bioeconomy concepts across all levels of education, creating supportive institutional frameworks, and enhancing communication and stakeholder engagement.

Across the three guiding questions, participants highlighted the need for:

- **Reducing complexity** through clearer narratives, more effective communication, and simplification that preserves essential depth.
- **Fostering win-win mindsets** and addressing resistance or “fear” associated with change.
- **Embedding circular bioeconomy thinking** at all educational levels through curricula, micro-credentials, and lifelong learning opportunities.
- **Shifting public and institutional perceptions** by using positive storytelling, demonstrating tangible benefits, and engaging diverse audiences – particularly younger generations.
- **Strengthening partnerships across academia, industry, policymakers, and society** by breaking down disciplinary silos and building trust among stakeholders.
- **Expanding international mobility, online collaboration, and shared teaching resources.**
- Creating frameworks – such as professional profiles and competence standards – to **support international recognition of qualifications in the bioeconomy sector.**
- **Communicating the circular bioeconomy through solution-oriented and positive narratives** rather than fear-based messaging.

2. Key Barriers to Advancing the Circular Bioeconomy

Participants identified a series of institutional, political, social, cultural, and psychological [barriers](#).

Institutional and Structural Barriers

- Fragmented educational approaches across Europe.

- Siloed disciplines and weak cross-faculty collaboration.
- Lack of institutional support or prioritisation of circular bioeconomy topics.
- Insufficient promotion and knowledge dissemination.

Political and Governance Barriers

- Political polarisation influencing policy adoption.
- Gaps or inconsistencies in waste and sustainability legislation.
- Resistance linked to perceived power or wealth redistribution.

Societal and Behavioural Barriers

- Low social trust and weak commitment to long-term sustainability.
- Public misunderstanding of bioeconomy concepts.
- Human tendency to resist change; fear-based reactions.
- A generational gap in awareness and engagement.

Knowledge and Communication Barriers

- Circular bioeconomy seen as overly complex or overly technical.
- Risk of the field becoming “just another EU policy buzzword.”
- Limited access to effective language, narratives, and visuals that resonate with diverse audiences.

These barriers collectively contribute to the perception that the circular bioeconomy is “too complex” or “just another EU buzzword”. It also demonstrates the need for coordinated action, strategic communication, and educational coherence – areas in which ICA can play a pivotal role.

3. Mindsets & Approaches Needed to Navigate Complexity

Participants agreed that complexity should not be avoided but **managed strategically**. Key principles include:

- **Simplification of the big picture** while adding complexity only when engaging with specific challenges.
- **Transforming fear into win-win understanding**, emphasising benefits rather than risks.
- **Bottom-up approaches** that respect local context and stakeholder realities.
- **Effective translation of complexity**, enabling different stakeholders – policymakers, businesses, citizens – to grasp key concepts.
- Integrating circular bioeconomy into **personal and societal value systems**, fostering deeper cultural adoption.
- Prioritising **positive storytelling and success cases**, especially for younger generations.

These mindset shifts are pivotal for both institutional and societal transformation and should inform ICA’s strategy.

4. Strengthening Education & Competence Development

Participants outlined concrete steps for ICA and universities to integrate circular bioeconomy into education and lifelong learning.

Curriculum Integration

- Introduce circular bioeconomy modules in **bachelor programs**.
- Develop **joint international master's programs**.
- Strengthen collaboration at **doctoral level**.

Lifelong Learning & Skills

- Develop **micro-credentials** for students and professionals.
- Introduce **new professional profiles in ESCO**.
- Promote **stackable learning pathways** and competence harmonisation.

Internationalisation & Collaboration

- Foster **Collaborative Online International Learning (COIL)**.
- Expand international learning opportunities (summer schools, exchanges).
- Enhance partnerships with industry, policymakers, and alumni.

Standardisation & Recognition

- Work toward **standardised competence frameworks**, potentially aligned with ISO.
- Create a shared language, terminology, and quality criteria for bioeconomy education.

The overarching message: ICA can help create coherence, mutual recognition, and higher quality in bioeconomy education across Europe.

5. The Role of ICA Moving Forward

Participants highlighted that ICA is uniquely positioned to act as a **coordinator, convener, and capacity-builder** for European universities working on the circular bioeconomy. The organisation's existing networks, reputation, and cross-disciplinary mandate allow it to play a central enabling role in addressing fragmentation, supporting educational innovation, and accelerating the transition. [ICA can facilitate](#) **harmonisation** of curricula, competence profiles, and micro-credentials across Europe.

▪ ICA as a Platform for Knowledge Exchange and Shared Teaching Resources

Participants emphasised the need for shared spaces where institutions can learn from one another. ICA could:

- Host **thematic communities of practice** on curriculum development, pedagogy, industry collaboration, and assessment.
- Curate and disseminate **good practices**, case studies, and teaching materials that members can adopt or adapt.
- Develop repositories of **open educational resources (OER)** in circular bioeconomy - lectures, case studies, digital simulations, and tools.
- Coordinate **joint teaching initiatives**, including guest lectures, inter-university workshops, and cross-institutional student projects.

This would build collective capacity while reducing duplication of effort among universities.

▪ Harmonisation of Curricula, Competence Profiles, and Micro-credentials

ICA can lead or coordinate a Europe-wide effort to:

- **Map existing programs** in circular bioeconomy across member institutions to identify gaps, overlaps, and opportunities for alignment.
- Develop a **shared competence framework**, translating circular bioeconomy principles into clear learning outcomes applicable at bachelor, master, doctoral, and lifelong learning levels.
- Support member institutions in designing **micro-credentials** that are mutually recognisable, stackable, and compatible with European certification systems.

This harmonisation would help reduce fragmentation, support mobility, and make bioeconomy qualifications more transparent for employers and students.

▪ **Strengthening Multi-stakeholder Collaboration**

The session highlighted the central role of ICA in **connecting academia with industry, policymakers, and civil society**. ICA could:

- Facilitate structured dialogues between universities and industry partners to identify real-world challenges and incorporate them into teaching and research.
- Bring policymakers into conversations on curriculum evolution, competence needs, and regulatory alignment in the bioeconomy sector.
- Encourage involvement of **alumni**, who can act as ambassadors, mentors, and industry connectors for current students.

By acting as a convenor, ICA helps bridge disciplinary and institutional silos and fosters trust and collaboration across the ecosystem.

▪ **Supporting Universities in Communication, Storytelling, and Societal Engagement**

Participants agreed that communication is a major barrier—and opportunity. ICA can help by:

- Providing **communication toolkits** for universities to explain circular bioeconomy concepts clearly to diverse audiences: students, local communities, policymakers, businesses, and the general public.
- Promoting **positive narratives and success stories**, demonstrating real benefits and countering fear-based messaging.
- Training educators and institutional leaders in **science communication**, framing, and effective public engagement.
- Supporting campaigns that highlight the relevance of the circular bioeconomy to **everyday life**, careers, and societal well-being.

ICA can ensure that communication across institutions is consistent, accessible, and aligned with European goals – helping the bioeconomy avoid becoming “just another policy buzzword”.

▪ **Promoting International Learning Ecosystems**

Participants identified international learning as a key catalyst for competence-building and innovation. ICA can:

- Support and scale **COIL (Collaborative Online International Learning)** initiatives, enabling students to work together across borders on bioeconomy challenges.
- Facilitate **international summer schools**, joint modules, and student mobility opportunities focused on circular bioeconomy topics.
- Promote cross-institutional research and education projects that provide **experiential learning**, such as living labs, challenge-based learning, and industry placements.

- Act as a neutral coordinator for **shared digital platforms**, allowing universities to pool resources, connect teaching staff, and co-create materials.
- Assist institutions in navigating accreditation and credit-transfer issues to support **seamless mobility** and recognition.

By fostering these transnational learning environments, ICA can help develop a European-wide talent pipeline equipped with the skills and mindsets needed for the circular bioeconomy.

6. Strategic Recommendations for ICA Leadership

Based on participant insights, ICA leadership should consider:

1. **Establishing a European Circular Bioeconomy Education Task Force** to lead harmonisation efforts.
2. **Developing an ICA Competence Framework** aligned with EU policy, industry needs, and ESCO profiles.
3. **Launching an ICA Knowledge Hub** with shared teaching resources, other open educational resources, and cross-institutional modules.
4. **Organising an annual ICA Bioeconomy Education Summit** to connect academia, industry, and policymakers.
5. **Designing a communication strategy** that provides members with tools, messages, and narratives.
6. **Investing in international learning infrastructure** (digital platforms, summer schools).
7. **Supporting pilot initiatives** (joint master's modules, micro-credentials, cross-border projects).

These actions would strengthen ICA's strategic leadership and accelerate Europe's transition toward a sustainable circular bioeconomy.

7. Conclusion

Transitioning to a circular bioeconomy requires both **structural support** (education, standards, partnerships) and **cultural transformation** (communication, trust-building, mindset shifts). ICA is well positioned to coordinate and accelerate these efforts across Europe. By simplifying complexity, strengthening educational pathways, and fostering collaboration across sectors, ICA can significantly enhance Europe's capacity to train the professionals and citizens needed for a sustainable and bio-based future.

The insights from this breakout session will be further discussed by the ICA Board and the relevant ICA Board Committees, including the ICA Network for Innovation in Life Sciences Higher Education and the ICA Community of Practice for Bioeconomy Education. The committees and the ICA Action Plans for 2025–2027 will be updated to reflect the suggestions, needs, and expectations expressed by ICA members.