



A Human Capital Agenda for the bio-based industry

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Storyline

For today

- The bioeconomy and the bio-based industry in Europe.
- The Bio-based Industries Consortium (BIC).
- BIC's Human Capital Agenda for the bio-based industry.



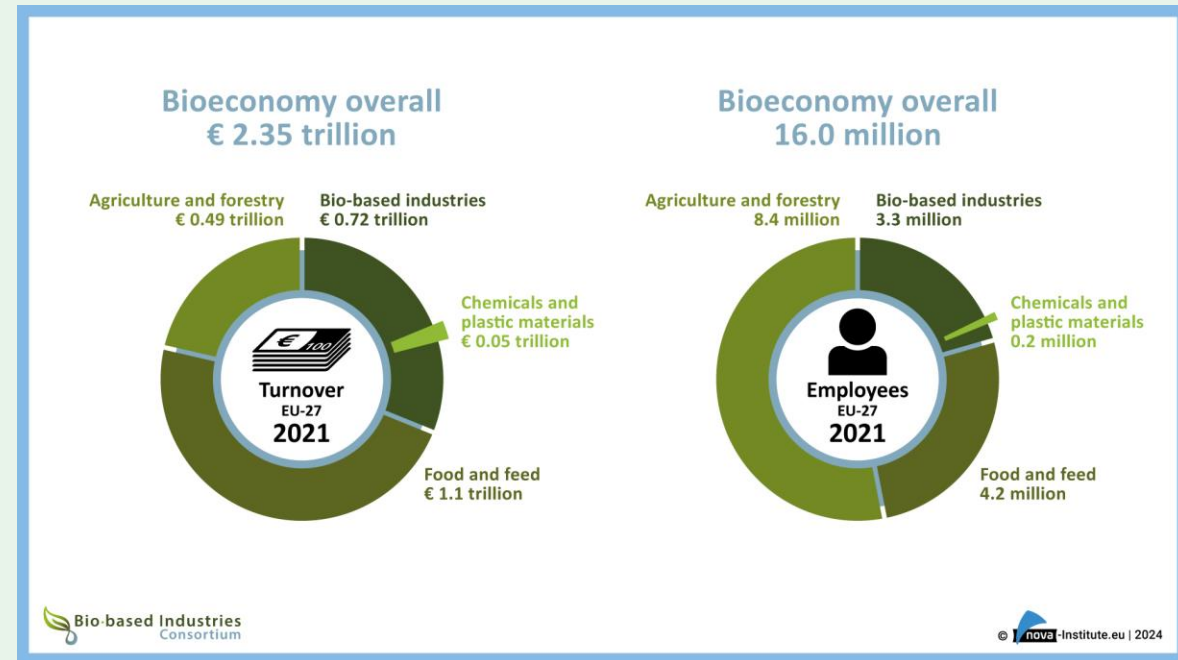


European bioeconomy in figures 2008 - 2021

- Major contributors to the turnover
 - Food & feed industries ($\approx 47\%$)
 - Bio-based industries ($\approx 31\%$)
 - Agriculture & forestry ($\approx 21\%$)
- To employment
 - Agriculture & forestry ($\approx 53\%$)
 - Food & feed industries ($\approx 26\%$)
 - Bio-based industries ($\approx 21\%$)

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Turnover and employment in the bioeconomy overall (2021, EU-27)

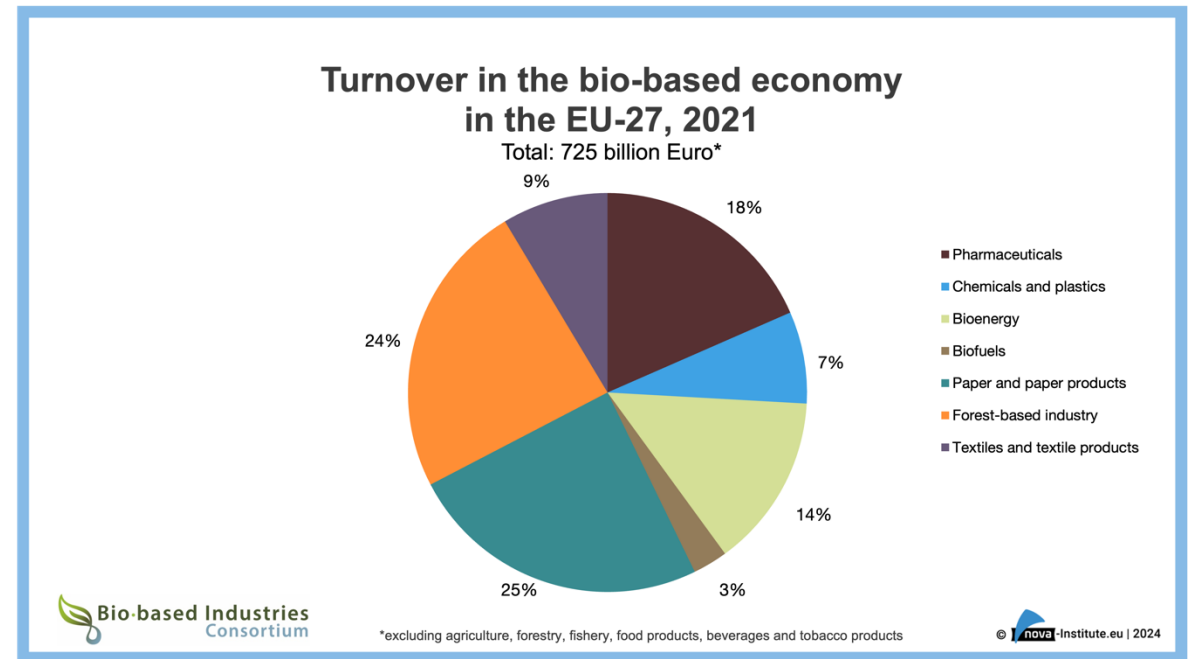




Turnover in the bio-based economy 2021

- Largest shares by
 - Paper & paper products (25%)
 - Forest-based industry (wood products and furniture) (24%)
 - Pharmaceuticals (18%)
 - Biofuels + bioenergy (17%)
 - Chemicals & plastics (7%)
- Total turnover growth from 560 billion in 2014 to 725 billion € in 2021

Turnover in the industrial sectors (the bio-based economy) (2021, EU-27)



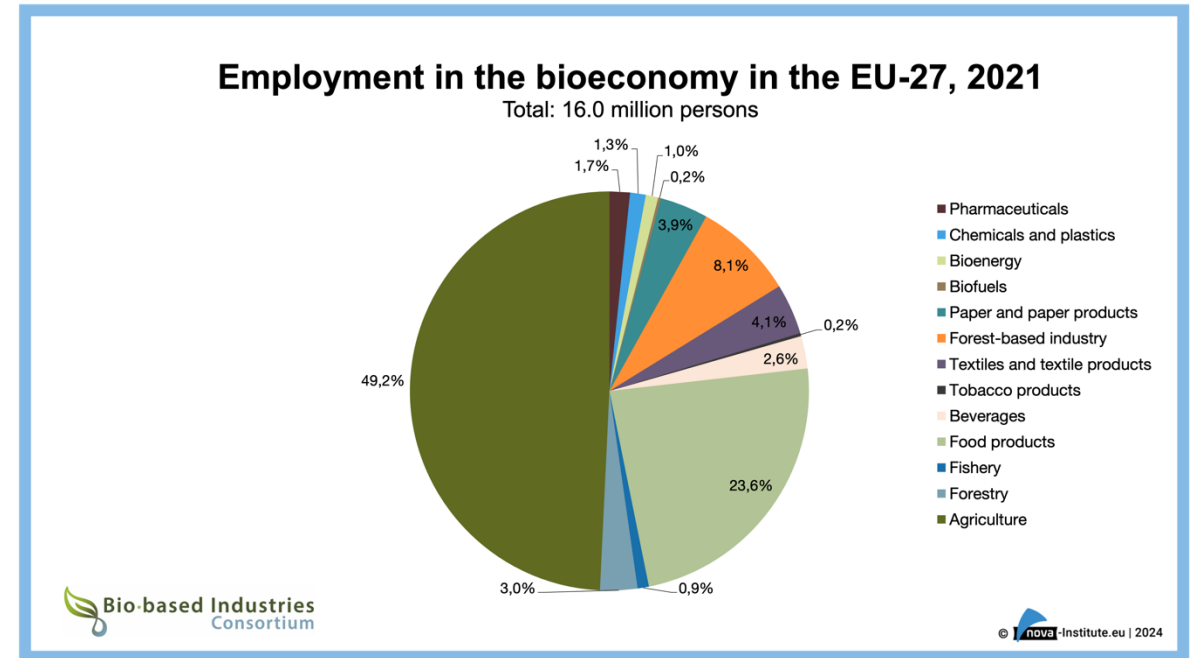


Employment in the bioeconomy, EU-27, 2021

- Largest shares by
 - Primary sectors (agriculture, forestry, fishing) (>53%)
 - Food and beverage industry (27%)
 - Bio-based economy (industrial sectors) (20%)
- Total employment is declining
 - Mainly in the agriculture sector (optimisation, automation, digitalisation; higher efficiency in production processes)

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Employment in the bioeconomy (2021, EU-27)



Education levels only available for primary sectors:
40% primary education (levels 0-2)
46% secondary education (levels 3-4)
14% tertiary education (levels 5-8)

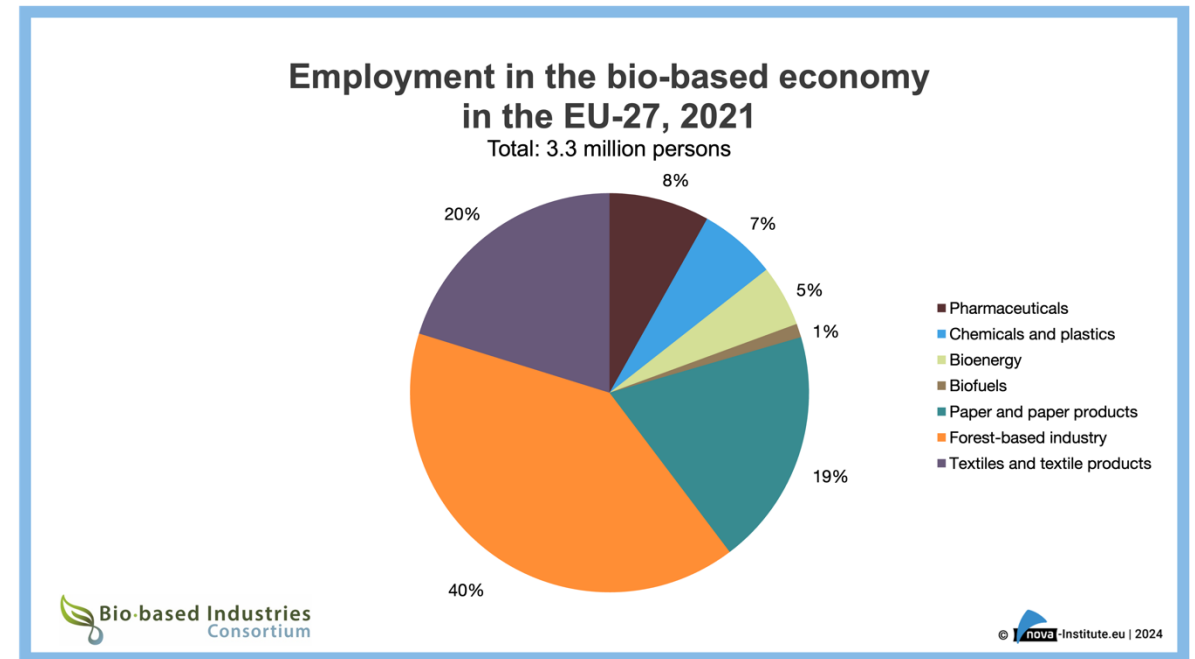


Employment in the bio-based economy, EU-27, 2021

- Steady increase from 2014 to 2018, followed by downward trend
 - Overall, still increase from 2.9 million employees 2014 to 3.3 million in 2021
 - Growth mainly in chemicals & plastics; and pharmaceuticals

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Employment in the industrial sectors (the bio-based economy) (2021, EU-27)

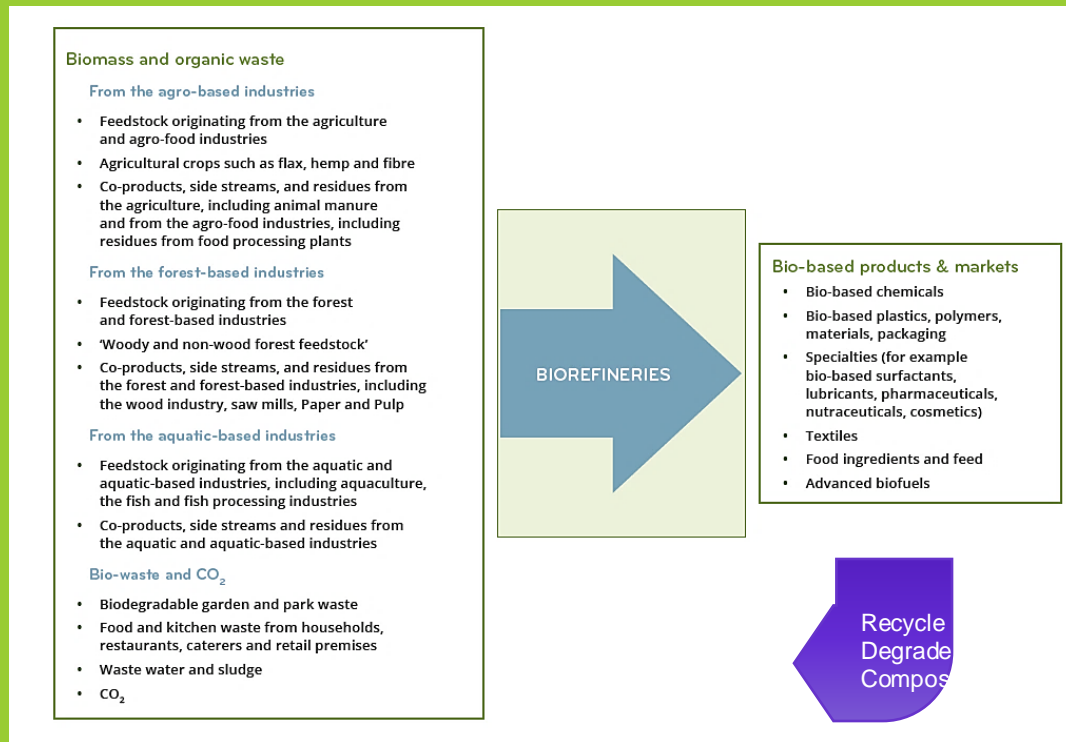


Education levels not collected for these sectors

But many changes and movements taking place!



BIC vision: Create the circular bio-society by 2050



The ending of our linear Society

Transition is needed



Turning the straight line into a circle



A circular bio-based society

Crossing the boundaries of:

- industry sectors
- academic disciplines / technologies / expertise
- geography/cultures

The Bio-based Industries Consortium (BIC) is a non-profit organisation connecting industry, academia, regions and citizens to transform bio-based feedstocks into novel sustainable products and applications, and create circular bioeconomy ecosystems through investments, innovation and know-how.

240+

industry (full) members

large companies and SMEs

200+

associate members

research organisations, academia and trade associations




1	CBE JU	2	Business
	<ul style="list-style-type: none"> ⌚ BIC represents the private sector in a public-private partnership with the European Commission called the Circular Bio-based Europe Joint Undertaking 		<ul style="list-style-type: none"> ⌚ Facilitating connections and providing market intelligence through activities including networking events and commissioned reports/studies
3	Finance	4	Society
	<ul style="list-style-type: none"> ⌚ Mobilising public and private finance and investors through services such as a regional funding platform and a pitching event 		<ul style="list-style-type: none"> ⌚ Increasing awareness, knowledge, acceptance and education through activities such as a student competition (BISC-E) and positive impact stories on the BIC Investment Portal




BIC also carries out specific activities to achieve a favourable policy, regulatory and financing framework for the bio-based industries, such as representing our members interest vis-à-vis the EU Institutions.


BIC actions in field of education amidst other actions




In 2018 AWP: Identify opportunities to promote careers, and research activities in the European bio-based industry
 1 May 2019 – 30 April 2020
 Boosting future careers, education, and research activities in the European bio-based industry
 Coordinator: Universitat Autònoma de Barcelona (ES)



In 2020 AWP: Create and interlink bio-based education centres to meet industry's needs of skills and competences
 1 September 2021 – 29 February 2024
 Preparing the creation of Bio-Based Education Centres to meet industry needs and boost the contribution of the bioeconomy to societal challenges
 Coordinator: Alma Mater Studiorum - Università di Bologna (IT)




By EU-CONEXUS.
 2-year programmes funded by Erasmus+, starting in Sept '22 through Sept '26 for MSc students across the world. Will apply for further funding.
 CRE (BIC) is member of the Joint Master External Advisory Board



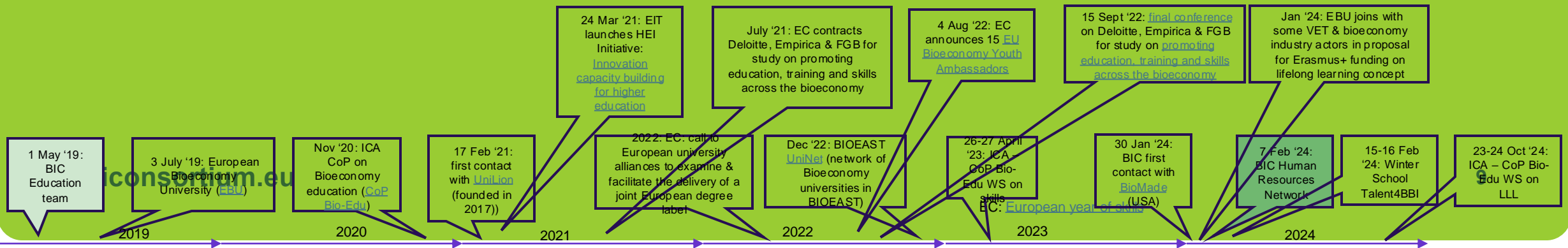
Industry-led PhD MSCA programme, managed by BIOrtic, the Bioeconomy SFI Research Centre, University College Dublin (UCD)
 September 2022 – September 2026
 10 industry and 8 academic partners ; 8 EU Member States & 1 Associated Country



BISC-E: Stimulate and practice entrepreneurship
 BIC annual programme since September 2019
 Adopted by BIC in 2019 to be fully integrated in BIC programmes
 Driven by national BISC-Es



By Oceano Azul Foundation & Cabuste Gulberkian Foundation
 Annual programme since 2018 for start-ups in marine bioeconomy sector
 CRE (BIC) is mentor since 2018. Winner(s) become 1 year BIC industry member





UrBioFuture 2020

Boost future careers, education, & research in the bio-based industry

From the UrBioFuture project

Industry stakeholders state:

- Current education system does not train the necessary skills required by the industry
- Educational programmes' changing pace is very low in adjusting to new industrial requirements or the progress of the sector

Confirming the need to increase collaboration between industry and education institutions.

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Top skills needed by industry by 2030+



Top skills needed by industry by 2030+





EC study 2022

Promoting education, training and skills across the bioeconomy

- Deloitte, Empirica, FGB
- Employment analysis and projections based on **qualification** level and on **occupation**

Skills and competencies in demand

Table 3 – Skills and competences in demand according to OVATE across all professionals (ISCO major group 2)

Skills	Percentage
personal skills and development	56%
adapt to change	55%
working in teams	55%
accessing and analysing digital data	50%
management and administration	41%
software and applications development and analysis	37%
using digital tools for collaboration and productivity	36%
developing solutions	34%
computer use	32%
database and network design and administration	30%

OVATE: Online Vacancy Analysis Tool for Europe (CEDEFOP)

Disciplinary knowledge in biology, chemistry, biochemistry: tacitly expected from graduates



BIObec 2024

Prepare the creation of bio-based education centres to meet industry's needs and boost the contribution to societal challenges

Guidelines for designing and running new bio-based education hubs (e.g. regional BBECs)

1. Apply a long-term perspective

2. Involve a university

3. Involve stakeholders early

4. Develop effective cooperation models and governance structures

5. Create models and facilities for cooperative research

6. Co-creation of suitable education programs and formats

7. Seek political support







8. Support networking with dedication

9. Keep stakeholders interested

10. Welcome diversity

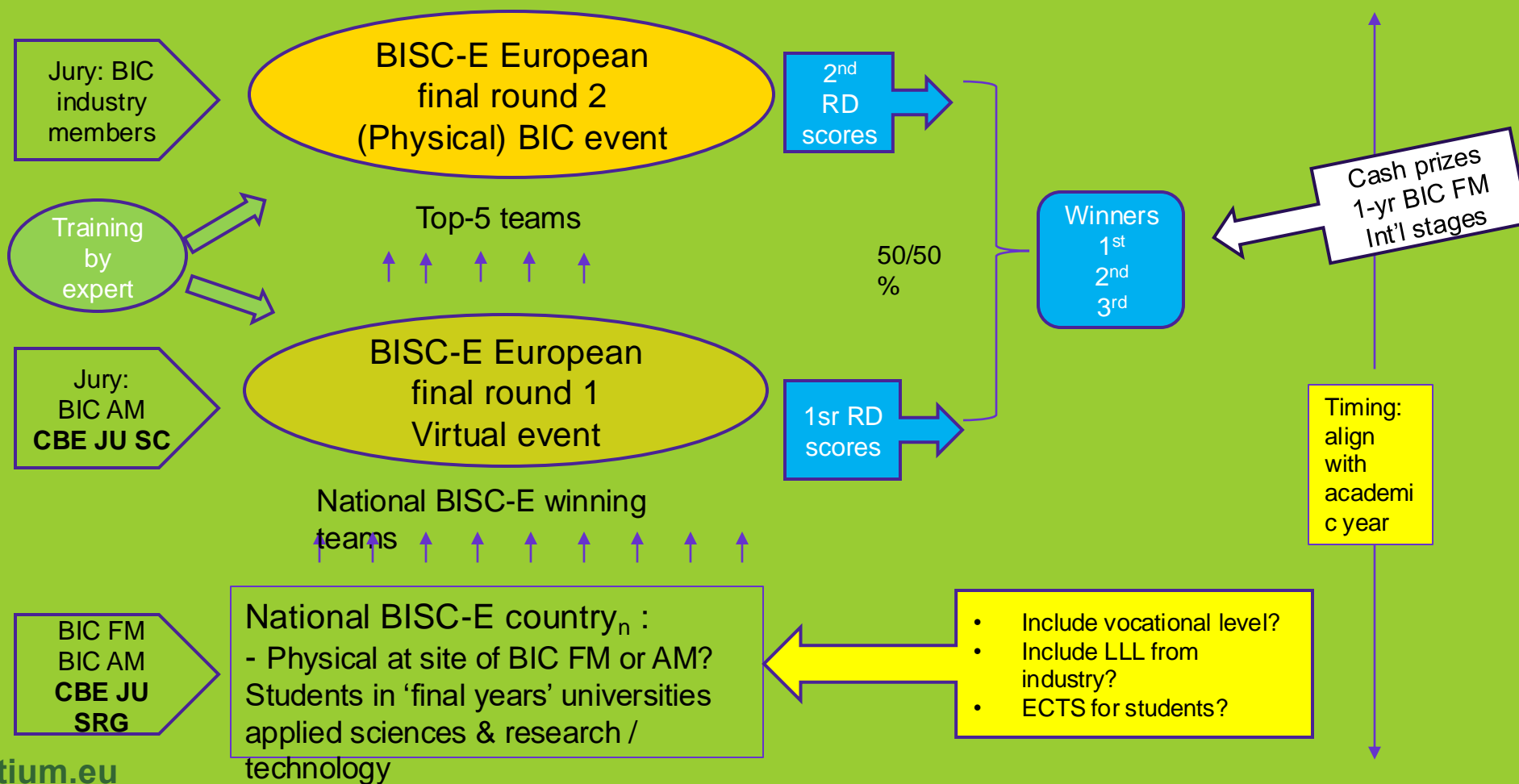


Biobec Bio-Based Education Centers

BBEC	Country	Main target beneficiary	Partners involved	Network	Knowledge area	Main value chains
BIObec Mediterranean Europe Hub	Italy, Spain 	UNIBO	SIE, CTA, CNR, FVA	Local to pan EU	Academic-industry	Food and food waste
BIObec North-West Europe Hubs-Finland	Finland 	UEF	APT (Nancy branch)	Regional/sector-oriented	Academic-industry	Forestry
BIObec North-West Europe-Denmark	Denmark 	FBCD	WU	Within the same country, region in Europe, pan-EU	VET and workforce	Food
BIObec North-West Europe-Ireland	Ireland 	MTU	IBF	National (Ireland) plus international students (e.g. UK)	Academic level, Industry	Aar-food, Marine
BIObec Central-East Europe-East	Poland, Czechia 	PRO-CIVIS, BIO HUB CZ	IBE, ART	Regional oriented to the BIOEAST region	Academic - Industry, VET and workforce	Fresh Water, Bioeconomy
BIObec Central-East Europe-Germany	Germany 	UHOH	BOKU; APT (Paris branch)	Regional (State Baden-Württ.), pan-EU (EBU), international	academic level, VET or workforce	Biorefinery, Agri-Food



BISC-E: Stimulate and practice entrepreneurship





BISC-E 2024 participation

BISC-E 2024	date of final
Belgium	24-Apr
Bulgaria	10-May
Croatia	24-May
Czech Rep	15-Mar
France	04-Jul
Germany	14-Jun
Greece	11-Jun
Iceland (AC)	14-Jun
Ireland	08-Mar
Italy	10-May
Latvia	26-Apr
Lithuania	24-May
Netherlands	31-May
Poland	31-May
Portugal	30-May
Slovenia	07-Jun
Spain	01-Jul
17	

BISC-E 2023 winner brought to international stage in:

- CBE JU SF
- Changemakers Festival Brussels
- BIOKET

Member of the team found employment at BIC member.

Linking BISC-E to:

- EU Bioeconomy Youth Ambassadors
- IACGB Bioeconomy Youth Champions
- Blue Bio Value

AC: Associated Country
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Confirmed participation BISC-E 2024



Created with mapchart.net




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Paths and themes

1. Meet bio-based industry's needs of skills and competencies and training.	2. Attract talented people through education.	3. Increase visibility and appeal of the bio-based industry as employer.
Industry's needs	Stimulate/support entrepreneurship among the youth and start-ups	Examples of jobs and corresponding skills and competencies
A European degree	On-site internships and graduating programmes	
New/alternative teaching methods		
Lifelong learning		
Education innovation infrastructure		
Structured dialogue between industry (by BIC) and academia (by alliances)		

Legend

Coloured action boxes indicate (uncoloured: TBA):

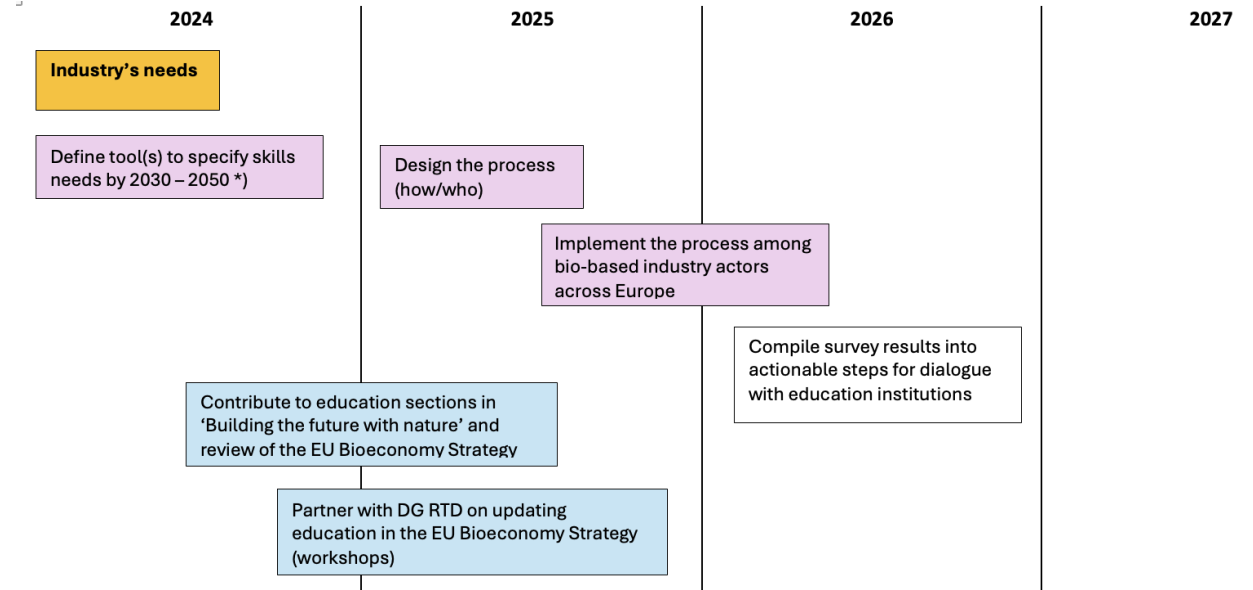
-  Action already in progress
-  Action possible as CSA in CBE JU AWP or as a BIC tender
-  Action for BIC staff supported by BIC working group Human Resources Network (HRN)



A Human Capital Agenda for the bio-based industry

- This theme is essential to set the base for a structured dialogue between industry and the academia
 - Since it's based on industry's self-expressed needs
- It could lead to co-creation of curricula for new entrants and training programmes to keep the current workforce up to date

Path 1 – proposed actions for the theme 'industry's needs'



*) Compare with BBI JU CSA [UrBioFuture](#) (1 May 2019 – 30 April 2020) and [EC study Identifying and measuring skills demand in the bioeconomy](#) by Deloitte, Empirica and FGB (September 2022)

- Action already in progress
- Action possible as CSA in CBE JU AWP or as a BIC tender
- Action for BIC staff supported by BIC working group Human Resources Network (HRN)
- (uncoloured) Action TBA



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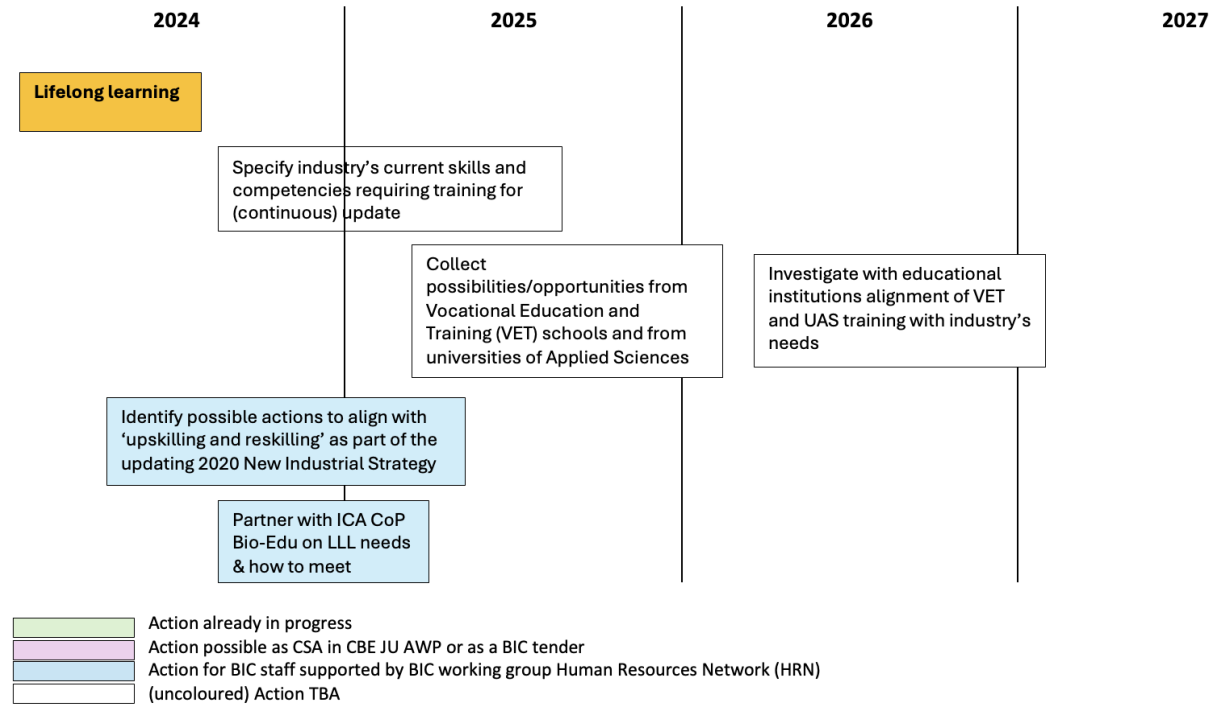
The industry: provide incentives to current workforce to regularly pursue knowledge update for personal and professional benefits

- Work with vocational schools, universities, and training centres
- Work with 'upskilling and reskilling' (announced in 'updating the 2020 New Industrial Strategy: Building a stronger single market for Europe's recovery')

BIC cooperates with ICA and its CoP for Bioeconomy Education in workshops on LLL

- With industry expresses its needs

Path 1 – proposed actions for the theme 'lifelong learning'



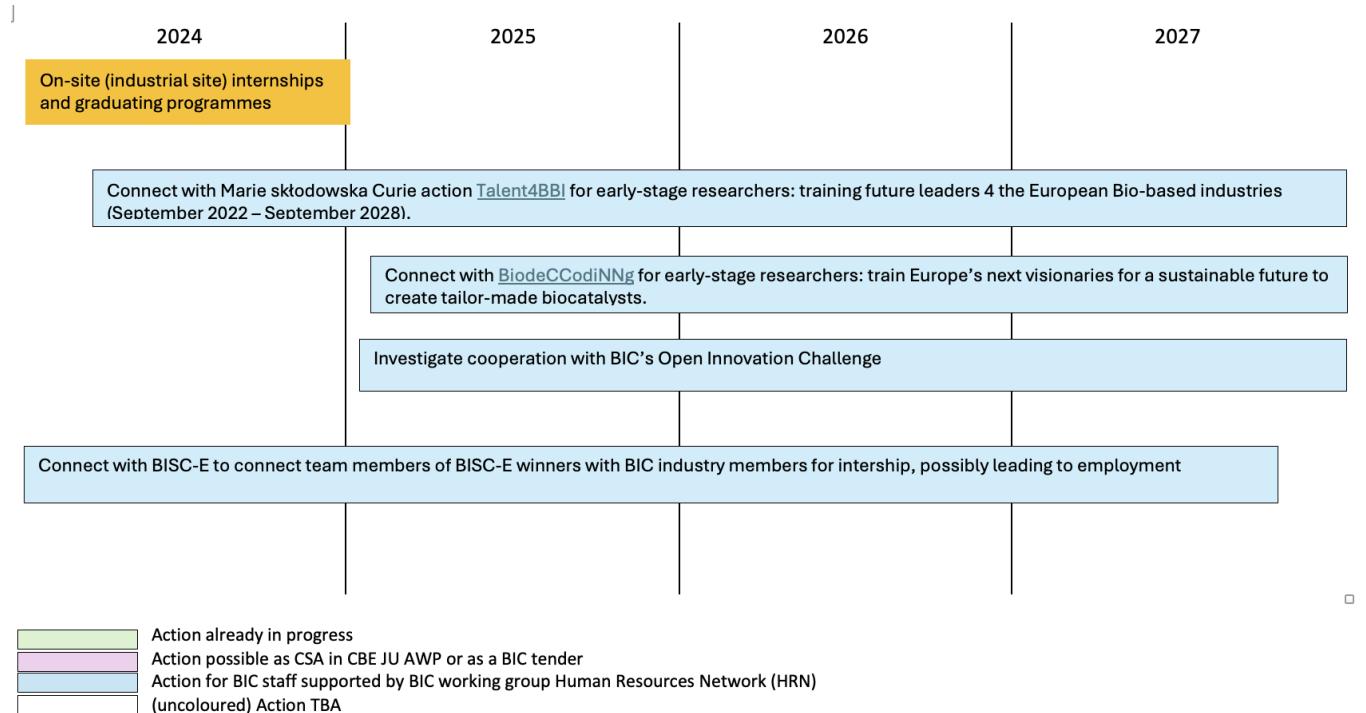


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Internship programmes can be beneficial for the intern, the university, and the industry.

The interns could be role models.

Path 2 – proposed actions for the theme ‘on-site (industrial site) internship and graduating programmes’





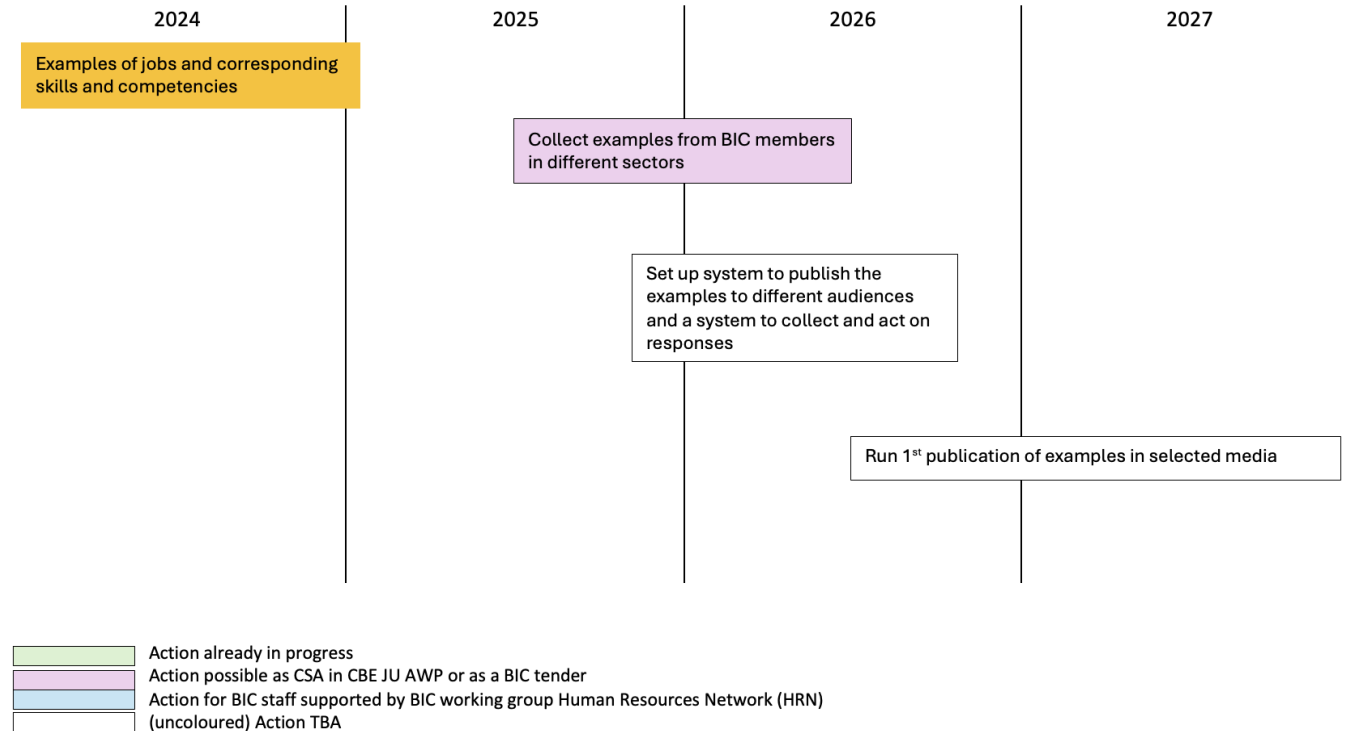
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To attract and maintain employees, it is essential for the bio-based industry to have a clear and ongoing communication on career opportunities.

Real case examples from:

- different industry actors (large, small, multinational, etc.)
- in different sectors (industrial, geographic locations, etc.)
- In different jobs (engineering, research, operations, logistics, data sciences, marketing, etc.)

Path 3 – proposed actions for the theme ‘Examples of jobs and corresponding skills and competencies’



A Human Capital Agenda for the bio-based industry
to ensure its future

A draft shared with BIC staff, and its highlights presented to the BIC board on 17 June 2024

Prepared by
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Director Human Capital and Stakeholder Relations for BIC
Supported by the BIC Human Resources Network (HRN)

31 May 2024

To have the human capital with needed skills and competencies to operate the sustainable bio-based ecosystems in the future, we must address education and training, and our image now.

With a structured dialogue between industry and academia





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