

Brussels, 7 May 2025
(OR. en)

8526/25
ADD 4

RECH 187
COMPET 316

COVER NOTE

From:	Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director
date of receipt:	30 April 2024
To:	Ms Thérèse BLANCHET, Secretary-General of the Council of the European Union

No. Cion doc.:	SWD(2025) 110 annex
Subject:	PART 4/21 COMMISSION STAFF WORKING DOCUMENT EVALUATION Interim Evaluation of the Horizon Europe Framework Programme for Research and Innovation (2021 - 2024) Accompanying the document Communication from the Commission to the European Parliament and the Council Horizon Europe: Research and Innovation at the heart of competitiveness

Delegations will find attached document SWD(2025) 110 annex.

Encl.: SWD(2025) 110 annex



EUROPEAN
COMMISSION

Brussels, 30.4.2025
SWD(2025) 110 final

PART 4/21

COMMISSION STAFF WORKING DOCUMENT

EVALUATION

Interim Evaluation of the Horizon Europe Framework Programme for Research and Innovation (2021 - 2024)

Accompanying the document

Communication from the Commission to the European Parliament and the Council

Horizon Europe: Research and Innovation at the heart of competitiveness

{COM(2025) 189 final}

Annex 12: Evaluation of Circular Bio-based Europe (CBE) JU

Annex to the Commission's interim evaluation of Horizon Europe

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1. Effectiveness

This section presents an analysis of the effectiveness of the partnership between the EU and the Bio-based Industry Consortium (BIC), which operated through the Bio-based Industry Joint Undertaking (BBI JU) from 2014 to 2020 and the Circular Bio-based Europe Joint Undertaking (CBE JU) – building on the legacy from the BBI JU – from 2021 up to 31 December 2023.

1.1 Achievement of the partnership and Horizon's objectives

The legal base for the BBI JU sets out seven specific objectives, which are reflected in the strategic innovation and research agenda (SIRA) published in 2013 and updated in 2017¹. The main objectives of the CBE JU are set out in the 2021 [Council Regulation](#) establishing the Joint Undertaking, namely: 1) to accelerate the innovation process and development of bio-based innovative solutions; 2) to accelerate the market uptake of existing mature and innovative solutions; 3) to ensure a high level of environmental performance; and a few more specific objectives, to focus the mission of the CBE JU. The 2022 SRIA describes the strategic priorities to steer R&I and other activities by the JU to achieve these. Following the Council Regulation, the CBE JU is a legal successor of the BBI JU. However, the CBE JU is not a simple continuation of the BBI JU, but builds on lessons learned from implementation of the BBI JU, and is shaped by the recommendations included in BBI JU interim evaluation².

Compared to the BBI JU, the CBE JU brings about several notable changes³. One of the key changes is the increased emphasis on circular economy principles throughout the entire bio-based value chains. The CBE JU seeks to foster the transition from linear to circular business models, promoting resource efficiency, waste valorisation, and the sustainable use of biomass. Another significant change is the expanded scope of the CBE JU. While the BBI JU primarily focused on bio-based industries, the CBE JU aims to integrate circular bio-based economy approaches across a wider range of sectors, including stronger participation by the primary biomass producers. This broader scope allows for greater synergies and collaboration across different economic sectors, fostering cross-sectoral innovation and systemic change. Additionally, the CBE JU is expected to enhance the participation of under-represented EU countries and regions.

The EU/BIC partnership has been evaluated as effective⁴. The partnership has resulted in funding for 194 projects so far⁵, of which 142 are under the BBI JU, and the rest under the current CBE JU, covering research and innovation actions (RIAs) and innovation actions

¹ The first BBI JU SIRA focused on five value chains, based on different feedstock (lignocellulose, forestry biomass, agro-based biomass, organic waste) which led to the update in the new SIRA including aquatic biomass.

² European Commission: Directorate-General for Research and Innovation, [Interim evaluation of the Bio-based Industries Joint Undertaking \(2014-2016\) operating under Horizon 2020](#) – Experts group report, Publications Office, 2017, <https://data.europa.eu/doi/10.2777/557859>. Pages 101-108.

³ [Partnership Evaluation Report: "Circular Bio-Based Europe Joint Undertaking"](#) Evaluation study on the European Framework Programmes for Research and Innovation for addressing Global Challenges and Industrial Competitiveness: Focus on activities related to the Green Transition. It is the recent external experts' report. Page 27. From now on, cited as 'External report 2024'.

⁴ Ibid. p. 27.

⁵ [Projects | Circular Bio-based Europe Joint Undertaking \(CBE JU\) \(europa.eu\)](#)

(IAs) – each targeting a specific technological readiness level (TRL) – and coordination and support actions (CSAs). The deployment of large-scale, first-of-a-kind projects at TRL 8, referred to as ‘innovation action-flagships (IA-FLAGs)’, has demonstrated the upscaling of bio-based sectors to market level, also yielding a high participation of small and medium-sized enterprises (SMEs) as coordinators and main investors.

However, there is a difference in the financial arrangements between BBI JU and CBE JU. In fact, a new ‘award criterion’ has been added to the evaluation process in the CBE JU calls to ensure that the minimum in-kind contribution to operational activities (IKOP) defined in the project proposal is: 20% of the total eligible cost of the project for IA-FLAG projects and 15% for IA projects which are not flagships⁶. Only contributions from members of the BIC are counted for IKOP.

Regarding the overall performance of BBI/CBE JU monitored through their key performance indicators (KPI) scheme, final results are available for BBI JU but not for the CBE JU, which funded projects from 2022 on. The assessment by the independent experts from the Teknologisk Institut⁷ – done at the end of the BBI JU KPI for the validation process – shows that most projects reached their key project objectives and that most BBI JU KPIs were achieved. In 2020 already, half of the KPIs were surpassing the targets set in the BBI JU SIRA 2017, as shown in the table below⁸.

BBI JU KPIs – numbers and definitions	KPI target in 2017 SIRA (to be achieved by end of the JU)	KPI reached in 2020	KPI reached in September 2023
KPI 1 - New cross-sector interconnections in BBI JU projects	36	47	181
KPI 2 - New bio-based value chains created with BBI JU projects	10	33	154
KPI 3 - Number of grant agreements signed between BBI JU and the project consortia	200	123	140
KPI 4 - New bio-based building blocks	5	22	112
KPI 5 - New bio-based materials	50	24	204
KPI 6 - New demonstrated consumer products based on bio-based chemicals and materials in IA projects	30	17	80 ⁹
KPI 7 - Number of flagship grant agreements signed between the BBI JU and project consortia	5	11	13
KPI 8 - Number of validated technologies that have achieved a ‘TRL gain’ of at least one level in RIA projects	20	12	47

⁶ For IAs the funding for profit-organisation is 60%, which is below the funding rate of Horizon Europe (70%).

⁷ Teknologisk Institut (2021): Study on BBI JU project portfolio and KPIs validation. Executive Summary. Prepared for Bio-Based Industries Joint Undertaking. Hg. v Danish Technological Institute/Food & Bio Cluster Denmark.

⁸ Compiled using figures reported in the BBI AAR 2020 and [CBE AAR2023](#).

⁹ In a wide range of applications, such as bio-based packaging, food and feed ingredients, cosmetics, construction, fertilisers and agricultural chemicals, textiles, etc.

Moreover, the evaluation of the project portfolio by the Teknologisk Institut shows that the project portfolio reflected the update of the SRIA: from a focus on biomass resources derived from agriculture and forestry in the first annual work programmes (AWPs), the scope of projects gradually changed towards the introduction of new sources (e.g. aquatic, municipal biowaste, wastewater, biogenic CO₂) from the 2016 AWP onwards. For instance, the update was mirrored by funding an IA-FLAG for a first-of-a-kind biorefinery valorising the organic fraction of municipal solid waste and aquatic-based feedstock in [CIRCULAR BIOCARBON \(2020\)](#), and, especially, an IA-FLAG for a first-of-a-kind biorefinery valorising aquatic-based feedstock in [SCALE](#).

The KPI scheme for CBE JU is an update of the one for BBI JU. It is highly complex, with 21 KPIs clustered in 10 main sectors. The KPIs will be mentioned below where relevant.

1.2 Long-term scientific, technological, societal and economic impacts

The evaluation of BBI/CBE JU impacts – part of partnership evaluation – has highlighted that reporting from BBI/CBE JU activities could include some additional elements, so it is more in line with the Horizon Europe (HEU) monitoring framework, as described in the following sections.

1.2.1 Scientific impacts

This section assesses BBI/CBE JU contribution towards the three key impact pathways¹⁰ (KIPs) focusing on the anticipated scientific impacts, namely 1) creating high-quality new knowledge, 2) strengthening human capital in R&I and 3) fostering diffusion of knowledge and open science.

Creating high-quality new knowledge (KIP 1): between 2015 and 2023, CBE JU and BBI JU projects delivered 808 publications, 149 patent applications (with 30 patents awarded), 1 registered design and 6 trademarks¹¹. Among the publications, 16% of the projects' past publications were highly interdisciplinary (against a benchmarking range of 9%-11%), 24% were highly multidisciplinary (benchmark: 13%-17%), and 22% were written as academic-private co-publications, well above the two relevant benchmarks¹². Furthermore, 64% were thematically aligned with one or more SDG. The share of these publications that was highly interdisciplinary was 6%, slightly below the benchmark (9%-11%). **However, the status of peer-reviewed publications still needs to be assessed.**

Strengthening human capital in R&I (KIP 2): the BBI JU reports a high proportion of projects contributing to creating and transferring knowledge (85% overall) based on the interdisciplinary nature of publications, including the transfer from academia to industry (77%) and building a scientific community (75%). **Data on researchers involved in**

¹⁰ Annex V to Regulation 2021/695/EU, the [Study to support the monitoring and evaluation of the framework programme for research and innovation along key impact pathways - Publications Office of the EU \(europa.eu\)](#) (which is the Indicator methodology and metadata handbook) and the [Study to support the monitoring and evaluation of the framework programme for research and innovation along key impact pathways - Publications Office of the EU \(europa.eu\)](#) (which is the Baseline and benchmark report).

¹¹ [CBE AAR2023](#) pages 78 and 154.

¹² 'External report 2024', page 46.

upskilling activities, or those already upskilled, including in terms of salaries – as requested in the KPI 2 – is not available.

Fostering diffusion of knowledge and open science (KIP 3): To encourage open-access publication, the CBE JU AWP's include a paragraph – in the 'Specific requirements' chapter – referring to the principles of open science and the possibilities offered by the European Open Science Cloud (EOSC) for storing and giving access to research data. **The proportion of publications that are open-access has not yet been recorded.** The 'External report' also includes a recommendation¹³ to build partnerships with academic institutions, research bodies, and industry associations for ongoing knowledge exchange.

1.2.2 Societal impacts

This section assesses the BBI/CBE JU contribution towards the three key impact pathways¹⁴ focusing on the anticipated societal impact, namely KIP 4 (addressing EU policy priorities & global challenges through R&I), KIP 6 (strengthening the uptake of R&I in society). It does not consider KIP 5 (delivering benefits and impact via R&I Missions), which is not relevant here.

Addressing EU policy priorities & global challenges through R&I (KIP 4): The societal impacts pursued by the partnership – in response to EU policy priorities and global challenges – encompass environmental protection, in terms of climate change mitigation/adaptation, biodiversity protection, zero pollution, circularity and reduced/efficient use of resources including water, and the contribution to the Sustainable Development Goals.

All projects funded under the two JUs contribute to some aspects of environmental protection⁸. A summary is given below.

Results from project	Share of BBI/CBE projects
Reduced CO ₂ and other greenhouse gas emissions	66%
Reduced energy consumption	34%
Reduced land use	21%
Water use efficiency	28%
Biodiversity protection/enhancement	11%
Utilisation and recycling of CO ₂ and other GHG	12%

The CBE JU places strong emphasis on achieving such impacts, drawing from lessons learned from its predecessor, BBI JU, which already aimed to deliver projects with reduced environmental impacts. In fact, the CBE JU is driven by the specific objective, among others, to *'Ensure the integration of circularity and environmental sustainability requirements, contribution to climate neutrality and zero pollution ambition in the development and implementation of bio-based research and innovation and facilitate societal acceptance'*. To meet this objective, the CBE JU AWP's require that R&I projects comply with specific

¹³ 'External report 2024', pages 40-42.

¹⁴ Regulation - 2021/695 - EN - EUR-Lex Annex V KEY IMPACT PATHWAY INDICATORS.

requirements on their environmental performances, both in the supply chain (especially in the case of primary biomass use) and in all segments of the value chain, including through a life-cycle assessment. To ensure the long-term impacts of the new generation of bio-based value chains contributing to environmental protection, specific requirements on environmental performances have been included in the current CBE JU work programme and are updated each year. A task force on sustainability aspects has recently been set up in the CBE JU Scientific Committee. Its remit is to tackle this challenge of long-term forecasting on environmental protection, and social and economic sustainability and long-term impacts on employment and economic growth throughout the EU, not only in urban areas but also in rural and coastal territories where biomass is produced, and which are often peripheral regions that rarely benefit from industrial development.

BBI JU projects contributed significantly to several SDGs¹⁵ (based on self-reporting, CBE JU AAR2023) especially SDG 12 (70% of the projects); SDG 9 (67%); SDG 13 (67%), and SDG 8 (41%)¹⁶. The current CBE JU puts more emphasis than its predecessor the BBI JU, on the circularity and environmental impacts of the bio-based economy. CBE JU projects are expected to contribute to SDGs 9, 12, 13, as the BBI JU did, but also to SDGs 14 and 15¹⁷.

Strengthening the uptake of R&I in society (KIP 6): Bioeconomy value chains present an opportunity for employment and inclusiveness, bringing a revitalisation of rural and coastal areas – where the biomass is produced – and the engagement of local communities, such as primary producers, public authorities and consumers.

The employment potential is better described under KIP 8. Regarding inclusiveness, primary producers have a key role in the development of the bio-based economy regarding essential aspects such as biomass provision, soil health, rural development and engagement of local economies, among others. At the same time, bio-based value chains present an opportunity for primary producers to diversify their sources of income, reduce bio-based residues or incorporate innovative technologies. Currently, 30% of BBI JU projects¹⁸ engage primary producers in their projects, and projects such as BRILIAN and ROBOCOOP-EU work on the development of new cooperative business models to maximise new business opportunities for primary producers. In addition, a new advisory body in the CBE JU governance structure, the Working Group on primary producers, will be established to promote the engagement of primary producers in the bioeconomy. Also, other KPI data reported for CBE JU, such as KPI1.2 (participation of biowaste managers, scoring 8 out of 20), KPI7 (participation of brand owners scoring 7/20) and KPI10 (under-represented countries and regions, scoring 67/150), are encouraging for the objective of inclusiveness.

¹⁵ SDG 12 - Ensure sustainable consumption and production patterns; SDG 9 -Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation; SDG 13 - Take urgent action to combat climate change and its impacts; SDG 8 - Promote inclusive and sustainable economic growth, employment and decent work for all.

¹⁶ From [CBE AAR2023 p. 77, Fig. 53.](#)

¹⁷ SDG 14 - Conserve and sustainably use the oceans, seas and marine resources for sustainable development; SDG 15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt the reverse land degradation and biodiversity loss.

¹⁸ From [CBE AAR2023 p. 75 Fig. 50.](#)

The engagement of local communities is well addressed, with 44% of BBI JU projects reporting synergies with local regional initiatives, 30% establishing an active collaboration with a regional administration, 45% reusing local residues, 37% mobilising local resources, 16% valorising unexploited marginal land and 14% reconverting industrial facilities¹⁹. This offers the potential for making the bioeconomy more inclusive in the long term – something that needs to be assessed in the evaluation looking at a potential continuation of the partnership.

1.2.3 Technological and economic impacts

This section assesses the BBI/CBE JU contribution towards the three KIPs focusing on the anticipated economic impact, namely 1) generating innovation-based growth, 2) creating more and better jobs, as well as 3) leveraging investments in R&I.

Generating innovation-based growth (KIP 7): Bio-based industries can play a role in ensuring EU's technological sovereignty and strategic autonomy and in boosting competitiveness, especially that of SMEs, while addressing the challenges of a green and just transition. The outcomes from the BBI JU, based on the KPIs (see the table in Section 1.1), show a strong commitment to achieving technological results, and success in doing so. Moreover, circularity is addressed in many projects. For example 42% of BBI JU projects address biodegradability (in specific environments and for specific applications) and 36% address (mechanical) recyclability²⁰. Finally, the 149 patents²¹ have already been mentioned.

The Council Regulation establishing the CBE JU calls for 'a strong, resource-efficient and competitive bio-based innovation ecosystem. ...can decrease dependency on and accelerate the substitution of non-renewable fossil raw materials and mineral resources. ...create value from local feedstock, including waste, residues and side-streams, to deliver jobs, economic growth and development throughout the Union, not only in urban areas but also in rural and coastal territories where biomass is produced and which are often peripheral regions that rarely benefit from industrial development'. With the continuation of the partnership between industry and the public sector, and the involvement of actors across different sectors, the aim is foster a market for innovations thus generating innovation-based growth. This is facilitated in particular by the JU mechanism of scaling-up processes throughout R&I actions, from lab scale to demonstration up to the (pre-) commercial level (TRL 8).

Looking back to impacts of BBI JU projects and ahead to what is expected from CBE JU projects, including IA-FLAGS, figures are not yet available on the actual rate of value chains achieved due to the JUs, for instance figures on market penetration or monetary equivalents (e.g. on change/increase in income of operators) which could help to quantify KIP 7. However, if the KPIs for the BBI JU projects continue to be monitored for the CBD JU projects, this could produce some statistically robust figures; it could also provide insights into the actual progress across the whole period 2015-2031, and possibly beyond.

Creating more and better jobs (KIP 8): Nearly 80% of BBI JU projects contribute to the creation of new jobs, targeting the creation of high-skilled jobs, especially in rural and coastal

¹⁹ From [CBE AAR2023](#) p. 75, Fig. 50.

²⁰ From [CBE AAR2023](#) p. 74 Fig. 49.

²¹ [CBE AAR2023](#) page 154.

areas. The creation of new local jobs is particularly important for IA-FLAG projects: the first 13 IA-FLAGs reported an estimated number of 4 700 and 15 000 new direct and indirect jobs, respectively²². For the CBE JU (last 6 IA-FLAG projects), this estimation is still pending, as the first projects started only in 2023. Still, CBE JU KPI 9 monitors the number of projects contributing to the development of skills and capacity needed by the EU bio-based sector. For the two first calls in 2022 and 2023, 20 projects were deemed to contribute, out an overall target of 50). **As a general consideration, the focus on innovation, including automation, digitalisation and other broader technologies supporting higher efficiency (e.g. in primary biomass production, but also in biomass biorefining conversion processes), may potentially limit the number of jobs created over the medium-term. However, the same innovation may result in higher-quality jobs and, once biorefineries have been deployed all over the EU, also the number of jobs absorbed by these industries may increase.**

Leveraging investments in R&I (KIP 9): The short-term impact from the partnership on investment – i.e. the amount of public and private investment committed in the partnership itself – is described under the next section, ‘Additionality’.

It is hard to assess the medium-term impact, in terms of the amount of public and private investment to exploit or upscale results from the partnership. The long-term economic impacts, for example the growth and market shares of companies having developed innovations under the BBI/CBE JU and the contribution to the 3% GDP target, is hard to assess, as well. In addition to the inherent complexity of these indicators, which depend on external dynamics such as markets, other constraints materialised during the evaluation period, in particular the COVID-19 pandemic and Russia's war of aggression against Ukraine, with major consequences for the EU, its industry and its competitiveness (energy, resource accessibility, market instability, etc.). **Thus, it is still hard to evaluate how effectively this partnership is leading to the deployment of first-of-a-kind biorefineries in the EU market.** However, the establishment of 19 IA-FLAGs within the scope of the of BBI/CBE JUs (at different operational level) between 2015 and 23, with high replicability potential, shows that JUs are capable of achieving such a long-term impact.

As a benchmark for BBI/CBE JU partnership, the long-term effect of Horizon Europe, in terms of expected GDP gains, can be considered. Based on NEMESIS economic modelling, data shows a steady increase in expected GDP gains attributable to Horizon Europe for the EU as a whole (EU27) – from EUR 0.2 billion in 2021, to EUR 3.3 billion in 2023 and EUR 14 billion by 2032-2034, making up 0.0012%, 0.023%, and 0.085% of GDP respectively (*from the draft Commission staff working document on the evaluation of Horizon Europe*).

The overall effectiveness of the BBI/CBE JU is apparent in the organisation's ability to drive its ventures towards achieving set objectives. However, it also underscores the complexities inherent in such partnerships. Therefore, there are some recommendations as to how it can maintain its overall efficacy. Most of these come from interviewees but they are backed up by the assessment findings²³:

- implement a robust stakeholder engagement strategy;

²² [CBE AAR2023 p. 57](#).

²³ ‘External report 2024’, pages 40-42.

- enhance JU's role by strengthening internal collaboration with the European Commission and BIC programming teams, aligning with other Joint Undertakings;
- implement a comprehensive risk management framework, to help address operational hindrances in the implementation of flagship projects;
- integrate with other EU policies and activities, e.g. dialogues and meetings with relevant Commission Directorates-General and EU agencies.

2. Additionality

2.1 Public and private R&I contribution mobilised by BBI/CBE JU

From the evaluation of all JUs performed by the European Commission (RTD.G2):

JU name	Horizon Europe contribution (a) (€)	Other EU contribution (b) (€)	Participants co-investment in EU R&I projects (c) (€)	Additional activities of JU members, costs incurred (d) (€)	Direct 'call' leverage factor (c) / (a + b) (€)	Direct leverage factor including additional activities (c + d) / (a + b) (€)
BBI-CBE	820 647 794		391 606 355	2 150 572 377	0.48	3.10
CBE	116 257 141	0	29 591 423	61 539 083 (388 094 406)²⁴	0.25	0.78 (3.6)

2.2 BBI/CBE JU 'internal' leverage²⁵

In June 2018, the Governing Board of the BBI JU, June 2018 adopted a decision stating how the in-kind contributions had to be considered, for operational activities (IKOP), additional activities (IKAA) and financial contributions, to determine the final leverage effect. This figure will be called 'internal' leverage in this context. On this basis, the 'internal' leverage of the BBI JU at the end of 2023 was 3.2, as reported in the table below. Contributions are still being validated.

	In-kind contributions to operational expenditure from all participants	Financial contributions to operational expenditure	In-kind contributions to additional activities	Total contributions other than EU	EU funding	Leverage
BBI JU	€487 928 957	€3 250 000	€2 150 572 377	€2 641 751 334	€822 066 902	3.2

In this calculation of the leverage, IKOP and IKAA are, conceptually, the same as columns (c) and (d) in the table provided in paragraph 2.1, but figures are slightly different.

Under the CBE JU, leverage has been calculated using the definition of the IKOP and IKAA in the [Council Regulation](#) establishing the JUs; only private partners are included. BIC

²⁴ Estimated IKAA, see next paragraph 2.2.

²⁵ According to the formula adopted by the GB

$\text{Operational leverage} = \frac{\sum \text{APIK}^4 + \sum \text{FC}^5}{\sum \text{EU contribution}^6}$ $\text{Additional leverage} = \frac{\sum \text{IKAA}^7}{\sum \text{EU contribution}^6}$	<p>⁴ Total amount of in-kind contributions committed by all participants (both BIC and non-BIC constituent entities) in grant agreements signed by the cut-off date of the data reported in the AAR</p> <p>⁵ Total amount of financial contributions ('FC') by BIC, delivered at programme level, and/or by all participants (both BIC and non-BIC constituent entities) that are beneficiaries not receiving funding, delivered at project level and committed by the cut-off date of the data reported in the AAR.</p> <p>⁶ Total amount of EU funding committed in grant agreements signed by the cut-off date of the data reported in the AAR.</p> <p>⁷ Total amount of in-kind contributions to additional activities ('IKAA') by BIC and/or its constituent entities implemented by the cut-off date of the data reported in the AAR and duly certified later</p>
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leading to the calculation of the 'Total leverage effect=additional leverage + operational leverage'.

beneficiaries have to report their IKAA estimations annually through the corporate IT tools and certification of IKAA for the CBE JU is performed by an independent auditor, typically after the investment has taken place. Thus, certification will be finalised only at the end of the CBE JU programme, likely between 2027 and 2031. However, the **estimated IKAA** and IKOP for the 2022 calls provide an expected **leverage of 3.6**, as reported below.

	Estimated In-kind contributions to operational expenditure from private partners	Estimated In-kind contributions to additional activities from private partners	Total contributions other than EU	EU funding	Leverage
CBE JU 2022 calls	€25 223 304	€388 094 406	€413 317 710	€116 257 141	3.6

3. Transparency and openness

3.1 New participants' and SMEs' access to projects

BBI/CBE JU's stated ambition includes a commitment to full transparency and openness, supported by its effort to engage a diverse range of entities in its programmes, with a particular focus on SMEs (see tables below on the participation patterns).

Newcomers to the CBE JU, defined as entities that have not applied for or received funding in the BBI JU or in any previous CBE JU calls, are strongly represented among both applicants and beneficiaries. The level of newcomers is high: 54% of CBE JU applicants (1056 out of 1944) had not applied under any of the BBI JU calls and 62% of CBE JU beneficiaries (366 out of 586) have not received funding previously. Newcomers are particularly successful in the partnership's calls, as the level of newcomers is even higher among beneficiaries than among applicants. In addition, 23% of them are SMEs (136 out of 586).

Already in BBI JU, a very high **SME** participation rate was observed. Concretely, between 2014 and 2020, SMEs received 37% of total BBI JU funding, accounted for 40% of all beneficiaries and two thirds of the private organisations involved in the projects. These rates far exceed the SME participation rate for H2020²⁶.

The expert evaluation report finds that 'The BBI/CBE JU framework has seen a transformative rise in SME engagement, underscoring their evolving roles in the bio-based economy. Initially, SMEs were mainly involved in innovation actions, often partnering with larger enterprises. However, they have progressively taken the lead, not only in research phases with lower TRLs, but also as primary coordinators for flagship projects²⁷.'

²⁶ 'External report 2024' p. 34.

²⁷ Ibid. p. 35.

Types of beneficiaries (%) in CBE JU and BBI JU projects (incl. multiple participations) ¹⁶				
Type of entity	CBE JU calls (2022 -2023) & BBI JU calls (2014-2020)	CBE JU 2023 call	CBE JU 2022 call	BBI JU (calls 2014-2020 calls)
Private companies	58.5%	49%	56%	59%
Research organisations	19.0%	21%	24%	19%
Higher education	13.7%	19%	11%	13%
Other	8.8%	11%	9%	9%

A similar picture emerges in the CBE JU, with SMEs accounting for 33% of beneficiaries and receiving 39% of funding in CBE JU Call 2022 projects³ (compared with only 20% so far in Horizon Europe (HEU)) (p. 1 of [Horizon Europe implementation – Key figures 2021-2023](#)).

Participation of SMEs in CBE JU and BBI JU projects				
	CBE JU calls (2022 -2023) & BBI JU calls (2014-2020) ²⁸	CBE JU 2023 call <small>Error! Bookmark not defined.</small>	CBE JU 2022 call ¹⁶	BBI JU (2014-2020 calls) ¹⁶
SMEs	32%	22%	33%	40%
Funding to SMEs	32%	25%	39%	37%

In addition, a significant number of coordinators (e.g. in call 2022,)²⁹ are SMEs.

3.2 Procedures for involving new stakeholders and grant beneficiaries

Starting with BBI JU results³⁰, the CBE JU has continued promoting collaboration and mobilisation of different stakeholders across the value chains (see KPI 1 – new cross-sector interconnections and KPI 2 new bio-based value chains). This has helped to broaden the range of beneficiaries (e.g. new focus on aquatic biomass and its producers). The independent expert report also pointed to the many communication and outreach activities under the BBI JU, including a successful launch campaign for the CBE JU carried out by the CBE JU PO programme office³¹. This is crucial to ensuring transparency and openness towards all potential participants.

In BBI JU projects, 38% of beneficiaries are BIC members. So far in CBE JU, the data based on the calls in 2022 and 2023 shows a significant further increase in BIC participation, to 45.9% of all beneficiaries (269 out of 586, unique), with 22% BIC newcomers (132 out of 586). This increase is mainly attributable to new BIC memberships, which is positive, as it confirms the increased engagement and commitment from private-sector partners. It may also be due to the new rules for participation that promote BIC membership³². For instance, a

²⁸ Source: CBE JU presentation in fifth CBE JU Scientific Committee meeting on 6 June 2024.

²⁹ Ibidem³: 'Initially, SMEs were mainly involved in innovation actions, often partnering with larger enterprises. However, they have progressively taken the lead, not only in research phases with lower TRLs, but also as primary coordinators for flagship projects.'

³⁰ [CBE AAR2023](#), p. 82.

³¹ (CBE JU 2022a).

³² For innovation actions, under CBE JU, including the flagships, applicants need to be a BIC member or become a BIC member before the call closure date, as the level of in-kind contribution to operational activities (IKOP) will be taken into account during the evaluation of such proposals, and IKOP can only be provided by BIC members.

significant share of all CBE JU Call 2023 applicants were entities that had newly joined BIC when they made their call proposal submission.

It remains to be determined whether BIC mobilises all relevant actors from the emerging European bio-based sector, as the way the sector is defined is changing. For example, it is unclear to what extent the broader industrial sector, such as chemical industry, is included, of how engaged market actors (e.g. brand owners) are in the green transition.

To expand participation in CBE JU projects, a dedicated [CBE JU widening strategy](#)³³ has been put in place, with an [action plan](#)³⁴ for 2023-2024. These aim to increase participation from the Horizon Europe ‘widening countries’ and has already produced a (limited) increase in the number of participants in funded projects, including some IA and IA-FLAG projects in such countries. In this context, a specific KPI has been set for the CBE JU (CBE JU KPI 10: ‘Improve participation of regions and countries with high unexploited potential and strategic interest to develop it’). However, increasing participation across the EU remains a work in progress (which is true also for other Horizon Europe instruments), and more efforts are needed, including at national level (e.g. focused support schemes, bio-based innovation programmes or broader bioeconomy governance). In this context, it is worth mentioning that at present almost no EU Member States from the Central and Eastern European macro-region (except Latvia) included under the widening instrument have developed and implemented a national bioeconomy strategy that recognises the role of the circular bio-based sector and related industry.

3.3 New BICs members

Since its foundation in 2013, BIC membership has evolved significantly in terms of the number of entities involved, sectors represented and geographic spread. The current membership includes 65 large enterprises, 135 SMEs (including microenterprises and startups), and 16 regional/national/international clusters representing a further 105 SMEs. SMEs (including those represented by clusters) account for almost 80% of industry members. Out of the 200 direct industry members (i.e. excluding clusters and the SMEs they represent), 24 (12%) come from widening countries and 19 (10%) from associated countries. The presence of such entities is steadily increasing, with a marked acceleration in the last three years thanks to awareness-raising by the BIC (e.g. participation in local events, organisation of dedicated webinars for widening National Contact Points (NCPs), and by CBE JU and CBE JU State Representatives Group members. It is expected to keep on growing significantly thanks to a dedicated ‘widening’ topic under the CBE JU 2024 AWP. In addition to industry members, the BIC also has 274 associate members, i.e. academia, research centres and associations.

3.4 Openness and transparency of consultation and priorities setting

The CBE JU priorities, reflected in the AWP and all the other activities of the JU, are agreed on between the two partners, the EU (through consultation with many Commission

³³ [CBE-JU-widening-strategy.pdf \(europa.eu\)](#)

³⁴ [CBE-JU-widening-action-plan-2023-2024.pdf \(europa.eu\)](#)

departments) and the BIC. Two advisory bodies are also consulted: the State Representatives Group and the Scientific Committee, to ensure alignment with national and regional policies and priorities, and with the most recent scientific findings.

Moreover, involving societal groups and considering their perspectives can contribute to a more inclusive and holistic approach to bio-based economy initiatives. There may be room for improvement in terms of effectively capturing and harnessing the impact of all actors involved in the projects, and other actors so far not engaged, e.g. non-governmental organisations (NGOs).³⁵ An inclusive participation strategy could be put in place, involving, for example, NGOs, small businesses and under-represented groups, as well as countries or regions. To improve inclusivity, CBE JU work programmes consider and may apply the multi-actor approach (MAA), which ensures the involvement of a targeted array of actors, including researchers, farmers, aquaculture producers, other businesses, consumer associations and civil society organisations including NGOs. Such an approach is applied as a mandatory element in all CBE JU IA projects, including IA-FLAG, and in some RIA and CSA projects.

In addition, under the CBE JU, partnership governance arrangements include new advisory bodies known as ‘deployment groups’ (DEGs). DEGs not only act as advisory bodies but also actively participate in strategic discussions setting the agenda for the partnership³⁶. It has been crucial to include these advisory bodies in the governance structure to ensure wider participation and higher private investment in the circular bio-based sector. At the time of writing (October 2024), work on setting up the first two DEGs is at an advanced stage and includes a Working Group on primary producers³⁷ and the DEG on finance and investment³⁸. However, it is still too early to estimate their real impact on the implementation of the partnership or, any broader influence on the European bio-based sector.

4. Efficiency

4.1 Operational and administrative budget implementation

The table below includes the total **operational costs** (OC) (EU contributions; Validated IKOP; Financial contributions to operational activities by JU partners; Eligible project costs funded by non-JU members to project activities; Contribution from Member States and international organizations to project activities), **certified IKA** and **running costs** (commitment appropriations EU voted budget and contributions from sources other than the EU³⁹) for the period 2014-2023. See also Annex 4.4.1 for a comparison of operational expenditure and administrative expenditure of Joint Undertakings and EIT KICs of the period 2014 -2023.

³⁵ ‘External report 2024’ pages 40-42.

³⁶ Council Regulation 2021/2085, recital 47.

³⁷ [Concept-note-CBE-JU-DEG-primary-producers.pdf \(europa.eu\)](#). Moreover, a specific 2023 Work Programme CSA topic [Supporting the CBE JU Deployment Group on Primary Producers](#) will support the implementation.

³⁸ [Note-on-deployment-group-finance-investments.pdf \(europa.eu\)](#)

³⁹ The administrative total contributions are paid equally by the Commission and BIC.

Operational and administrative expenditures (source: CORDA database)

The table includes data for Circular Biobased Europe and Biobased Industries-BBI Joint Undertakings. OC: Operational Costs; IKAA: Certified IKAA; RC: Running Costs

	2014 [EUR]	2015 [EUR]	2016 [EUR]	2017 [EUR]	2018 [EUR]	2019 [EUR]	2020 [EUR]	2021 [EUR]	2022 [EUR]	2023 [EUR]	Total
OC	-	77,746,937	251,032,959	256,045,853	129,300,632	168,254,662	165,240,462	164,632,646	-	145,848,564	1,358,102,714
IKAA	-	291,482,000	187,377,001	195,985,238	59,919,566	79,083,090	196,913,147	307,840,098	420,496,032	-	1,739,096,172
RC	580,758	3,032,300	4,192,711	4,957,193	4,950,678	3,025,544	5,282,632	4615066.00	6,104,052	5,551,514	42,292,448

The overall **implementation rate** for BBI JU CAs was very high, at 99.6%, due to the huge response to the calls for proposals and the ability to maximise unused CAs for subsequent calls for proposals. The remaining unused commitments were also reactivated to complement the first CBE JU call, thanks to a provision in the Council Regulation. The first CBE JU calls (2022 and 2023) show similar levels of implementation (98.9%).

The implementation rate for BBI JU PAs is 97.5% so far, with some BBI JU projects still running. PAs for the CBE JU have been used up for the prefinancing payments of call 2022.

Implementation of the administrative budget for the BBI JU has been particularly efficient (93%), aiming at consuming the full budget by the end of 2024. The corresponding figure for the CBE JU is just 4%, which is unsurprising given that large amounts of appropriations were received in 2022 and 2023 and the CBE JU is prioritising the execution of the unused reactivated appropriations for the BBI JU up to end 2024.

4.2 Operational efficiency indicators (time to pay (TTP), time to inform (TTI) and time to grant (TTG))

In terms of budgetary and financial management over the whole period (2014-2023), the KPIs reported below show a strong performance for both BBI and CBE JUs.

- TTP for admin transactions was/is 20 days for both the BBI JU and the CBE JU on average (out of the Horizon Europe target of 30);
- TTP for operational payments (interim and final) was 69 days (out of 90) for the BBI JU on average;
- TTI was/is 116 days for the BBI JU and 126 days for the CBE JU (out of a target of 153) on average;
- TTG was/is 234 days for both the BBI JU and for the CBE JU (out of a target of 245) on average.

For the BBI JU, 97% of all interim and final cost claims validated were paid on time. There have not yet been many administrative payments for the CBE JU, but for the BBI 95% of administrative payments were paid on time, with the average TTP being 20 days – well within the 30-day time limit. Regarding the TTG, all CBE JU grants were signed within the TTG deadline.

In the above calculations, no applicant costs and/or beneficiaries' administrative burden are included, as they are not available/applicable.

5. Coherence and synergies

5.1 Coherence with regional and national policies

Coherence with regional and national policies/programmes in the BBI JU and the CBE JU is ensured by the State Representatives Group (SRG) as advisory body to the Governing Board, which, through its consultations, checks that all JU programming levels, from SRIA to AWP, are well aligned with such policies and their priorities via its consultations⁴⁰. An example of such interaction is the potential impact of the CBE JU on the 11 Central and Eastern European EU Member States grouped under the BIOEAST Initiative, which consider the CBE JU as a key example for strengthening their bio-based R&D landscape, in particular, with interaction with EU R&I leaders and the BIC. The SRG also provides the Governing Board with information on regional and national research and innovation programmes and initiatives to ensure complementarities and synergies with the CBE JU programme.

5.2 Coherence with EU policies

The BBI/CBE JU's initiatives are underpinned by the EU bioeconomy strategy and its update. The coherence of the CBE JU with EU policies/programmes has been analysed and included in the SRIA. The CBE JU's objectives are in line with the European Green Deal – addressed by the daughter policies – to produce major contributions to the EU climate targets by: delivering innovative bio-based solutions and paving the way for Europe to become the first climate-neutral continent by 2050; protecting and enhancing biodiversity; combating pollution; reducing fossil resource dependence; and deploying a just transition. The priorities set by the Commission through the new Biotechnology and Biomanufacturing initiative⁴¹ alongside those set by other EU institutions such as the European Council and the European Investment Bank, position CBE JU activities in the broader context of European competitiveness and strategic autonomy, supporting growth and job creation and a stronger involvement of the primary biomass sectors (agriculture, forestry and aquatic sector).

5.3 Coherence and synergies with other parts of the Framework Programme and with other EU, regional and national programmes

Alignment at programming level has been used to tackle issues of coherence and synergy, especially complementarity, between the BBI/CBE JUs and activities under Horizon 2020 and Horizon Europe, including missions and other relevant partnerships (see also Section 7).

In fact, the scope of BBI/CBE JU – as defined in the legal basis and then in their strategic agendas⁴² – coincides with the scope of some parts of the Horizon programmes. For example,

⁴⁰ [2024 biennial monitoring report](#) on partnerships in Horizon Europe.

⁴¹ COM(2024) 137, 'Building the future with nature: Boosting Biotechnology and Biomanufacturing in the EU', which recognises the CBE JU, specifically, as a key financing instrument to foster public and private investment in biotechnology and biomanufacturing under HEU. See also publication [CBE JU as key EU biotech and biomanufacturing instrument.pdf \(europa.eu\)](#).

⁴² In the [CBE Strategic Research and Innovation Agenda \(SRIA\)](#), the scope of the JU is defined as follows: 'The partnership will include all the economic and industrial sectors of the bioeconomy, therefore those that use biological resources and processes to produce food, feed, bio-based products, energy, and services. However, because the challenges for bio-based innovation in these sectors are quite broad and different, it was agreed by

specific areas of H2020 work programmes aligned closely with BBI JU: Societal Challenge (SC) 2 – focused on improving food security, developing sustainable agriculture and promoting research in the bio-based economy; SC 3 on secure, clean, and efficient energy; and SC 5 on climate action, environment, resource efficiency and raw materials, as well as the Leadership in Enabling Industrial Technologies (LEIT) programme⁴³. Of the EU contribution to BBI, 85% (EUR 828.75 million) came from SC 2 and 15% (EUR 146.25 million) from LEIT.

Under Horizon Europe (Pillar II) Cluster 6 ‘Food, Bioeconomy, Natural Resources, Agriculture and Environment’⁴⁴, Intervention Area 6 (IA6) ‘Bio-based Innovation Systems’ consists of seven ‘broad lines’ listed in the legal base. The aim is to deliver on innovation in bio-based value chains and to produce processes, materials and products from sustainable biomass, including those enabled by biotechnology and life science and their convergence with digital technologies. Further, IA6 should lead to a better understanding of the boundaries of the bio-based economy in the broader European bioeconomy, and of its synergies and trade-offs with a healthy environment. Lastly, bioeconomy should become more socially inclusive. Most of the broad lines are relevant for the programming of the CBE JU and its thematic scope. IA6 provides 90% of the public EU contribution to the implementation of the CBE JU, while IA 3 ‘Agriculture, Forestry and Rural Areas’ – from the same Cluster 6 – provides the other 10%. Building on the experience of the BBI JU, the multi-annual programming (MAP) approach developed from the CBE JU 2022 AWP onwards has helped to improve the coherence and complementarity of programming under the CBE JU and HEU Cluster 6. Basically, the approach involves the Commission and the BIC for the CBE JU AWP the drawing up a plan for R&I activities in bio-based industrial systems up to 2027 – the year of the last CBE JU AWP. The same Commission departments are consulted for the MAP as for programming under HEU, thus ensuring that the two processes are complementary (and avoiding overlaps or replications).

Despite the similarity and overlaps in scope, BBI/CBE JU activities differ from the other Horizon (H2020/HEU) activities in some key aspects of their goals and implementation instruments. BBI/CBE JU projects and governance focus on marketable solutions and deployment, also from the business point of view, including the implementation of first-of-a-kind industrial facilities, while programming activities under Horizon aim to build a systematic approach to addressing challenges and delivering integrated solutions.

With regards to potential synergies with initiatives by the European Institute of Innovation and Technology (EIT), such as EIT InnoEnergy and EIT Food, circular bioeconomy pathways

the partners that the scope of the partnership will focus on the production of bio-based chemicals, materials and products other than biofuels and bioenergy, food and feed (food and feed ingredients and soil nutrients are in the scope), pharmaceuticals and medical devices.’

⁴³ And more specifically in LEIT ‘Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing’ ‘Biotechnology’.

⁴⁴ Council Decision (EU) 2021/764 of 10 May 2021 establishing the Specific Programme implementing Horizon Europe – the Framework Programme for Research and Innovation, and repealing Decision 2013/743/EU (Text with EEA relevance).

and contributions to a circular bio-based economy could be better explored⁴⁵, with a greater emphasis on the potential for coherence and collaboration (Özbolat et al. 2019)⁴⁶.

The recent [2024 biennial monitoring report](#) indicates potential synergies between the CBE JU and four (out of five) EU Missions (Adaptation to Climate Change, Climate-Neutral and Smart Cities, Restore our Ocean and Waters, and the Soil Deal for Europe), and between the CBE JU and Cluster 4 (Industrial dimension) and its partnerships, Made in Europe and Process4Planet, along with Blue Economy, EIT Food and EIT Industries. The 2024 biennial monitoring report also recommended exploring synergies with the LIFE Programme for Environment and Climate Action, as well as the InvestEU Programme, still to be explored. However, it is important to clarify that, in this context, ‘synergies’ refers to programmatic alignment without any financial contributions (no cross-funding) from these or other programmes received by CBE JU calls or shared by the CBE JU with other programmes.

To foster pragmatic synergies with other EU funding programmes, including financial contributions, the BBI JU launched the pilot initiative ‘BBI JU Synergy Label’ in 2019. The initiative supports the uptake of excellent above-the-threshold proposals that could not be financed by the JU due to budgetary constraints⁴⁷, helping them secure alternative funding from European, national, regional or local development agencies. Despite having signed a memorandum of understanding with the European Bank for Reconstruction and Development ([EBRD](#)) and the European Circular Economy Fund ([ECBF](#)), and an advisory service agreement with the European Investment Bank under the InnovFin initiative⁴⁸, the synergy label award was ultimately not successful, because of the different economic schemes (grants versus loans) and eligible applicants (consortia versus single company). As a result of efforts to support project financing, the CBE JU has obtained a mandate to establish a deployment group on investors.

6. EU added value

The partnership approach had facilitated 194 projects as of July 2024⁴⁹, involving partners from across Europe, particularly those projects in higher TRL stages. In fact, enhanced multinational collaboration is crucial for projects at higher TRLs⁵⁰ because it enables the formation of consortia with diverse expertise and resources. Such projects could not be achieved at regional or national levels throughout the EU, especially considering the disparate level of bio-based innovation among EU Member States and stakeholders, some of which are still in the early stages.

⁴⁵ ‘External report 2024’ p. 24.

⁴⁶ Özbolat, Nida Kamil; Haegeman, Karel; Sereti, Katerina (2019): Institute of Innovation and Technology (EIT) knowledge and innovation communities (KICs): Collaboration in a RIS3 Context. Hg. v Publications Office of the European Union.

⁴⁷ [bbi-ju-aar-2019.pdf \(archive-it.org\)](#)

⁴⁸ [bbi-ju-aar-2020_published.pdf](#)

⁴⁹ [Projects | Circular Bio-based Europe Joint Undertaking \(CBE JU\) \(europa.eu\)](#)

⁵⁰ External report 2024’ p. 39.

SMEs have emerged as key actors in BBI/CBE JU's projects. Their increasing participation, from IA to leading IA-FLAG projects, is a measure of how attractive and suitable the projects appear to SMEs.

The principle of inclusiveness, which is part of the mandate of the JUs, was a weak element in the BBI JU: there was an uneven geographical distribution of participants and coordinators, as well as of high TRL projects across the EU. For example, the EU13 Member States⁵¹ counted for just 7% of participation (and 11.2% of the Commission contribution), when considering the number of supported organisations in projects funded by the BBI JU⁵².

This has led to a dedicated [CBE JU widening strategy](#) and [action plan](#) (see Section 3 for details) to increase participation from widening countries, which is still very limited (in the first CBE JU calls), although the expansion of flagships across the EU has led to a more balanced geographical distribution.

The BBI/CBE JU played a crucial role in facilitating the creation and expansion of R&I networks that bring together relevant and competent actors from across Europe, thus contributing to the realisation of the European Research Area (ERA)⁵³. These networks are instrumental in driving collaboration, knowledge exchange, and the sharing of best practices, ultimately leading to enhanced innovation and scientific advancements in the bio-based economy.

Top 15 country	Number of projects	Participations		EC contribution		EC Contr. per part. (EUR 1,000)	Order
		Nb	Share (%)	EUR (1,000)	Share (%)		
Germany	107	197	10,5%	79.623	10%	404,2	1
Spain	92	318	16,9%	112.633	14%	354,2	2
Italy	83	209	11,1%	83.436	10%	399,2	3
Belgium	80	149	7,9%	63.995	8%	429,5	4
Netherlands	74	178	9,5%	70.531	9%	396,2	5
France	64	179	9,5%	96.290	12%	537,9	6
United Kingdom	56	94	5,0%	43.341	5%	461,1	7
Finland	36	73	3,9%	31.041	4%	425,2	8
Austria	31	51	2,7%	16.236	2%	318,4	9
Switzerland	28	34	1,8%	7.739	1%	227,6	10
Sweden	28	53	2,8%	19.394	2%	365,9	11
Portugal	26	42	2,2%	13.219	2%	314,7	12
Denmark	25	40	2,1%	14.915	2%	372,9	13
Ireland	25	36	1,9%	26.298	3%	730,5	14
Greece	22	30	1,6%	8.543	1%	284,8	15

In the above table, EC=European Commission; decimal numbers use ',' and thousands '.'

Generally, the advisory bodies from the Commission, the BIC, the EU Member States and the EU scientific community ensure that the multinational dimension is accurately represented in an EU-wide initiative, and that the strategic agenda of the JU is set to support the growth of the EU bio-based economy and to achieve common EU objectives sustainably, especially towards the European Green Deal targets.

⁵¹ EU13 Member States - countries that joined the EU in and after 2004 - in comparison with the EU15 Member States - which entered the EU before 2004

[https://www.europarl.europa.eu/stoa/en/document/EPRS_IDA\(2020\)641542](https://www.europarl.europa.eu/stoa/en/document/EPRS_IDA(2020)641542)

⁵² 'External report 2024' p. 19.

⁵³ 'External report 2024' p. 30.

7. Relevance

The relevance of the BBI/CBE JU objectives to the challenges and needs addressed by the framework programme lies in their capacity to drive innovation, foster industry engagement, and reduce dependency on raw-material imports. Additionally, the bio-based economy plays a vital role in achieving a green transition, promoting sustainable growth and revitalising rural and coastal areas². In this context, the partnership serves as a global example of dedicated R&D efforts toward a green transition and is recognised as such⁵⁴.

H2020 and HEU, the BBI JU first, and the CBE JU now, have all been aligned with the policy priorities set out in the R&I framework programmes.

- Under H2020, the BBI JU has been found⁵⁵ to be well aligned with SC 2 and the LEIT programme, the two financial sources for the BBI JU (accounting for 85% and 15% of the public budget, respectively). While SC 2 and LEIT Biotechnology continued to support research and innovation activities relating to the entire bioeconomy, the BBI JU aimed to strengthen the bio-based industry sector by industry-driven activities. It mainly financed projects with higher technology readiness levels and market potential than SC 2 and LEIT.

The links with policies were analysed carefully in the 2013 BBI SIRA, which was updated – and actually fully redrafted – in 2017, demonstrating the flexibility and adaptability of the agenda.

- Under Horizon Europe, the public budget for the CBE JU comes from IA6 (90%) and IA3 (10%), both delivering the Cluster 6 work programme contributing to HEU policy priorities on climate action, biodiversity (protection and enhancement), clean air and zero pollution, and digitalisation. The HEU 2025-2027 strategic plan describes Cluster 6 as fostering the bioeconomy and bio-based systems to replace carbon intensive and fossil-based ones, increasing stakeholder participation along the value chains, and bringing resilience to rural and coastal communities⁵⁶, objectives that are also tackled by the CBE JU.

In general, insights from interviews⁵⁷ confirmed that the strategic orientation and commitments of the CBE JU are closely aligned with the objectives of the EU's Green Deal. This alignment is well reflected in the CBE JU's SRIA, (with no plans to update the SRIA).

⁵⁴ e.g. by USA government, discussions in scope of the global bioeconomy governance, the Global Bioeconomy Summit and the International Bioeconomy Forum.

⁵⁵ Interim evaluation of the Bio-based Industries Joint Undertaking (2014-2016) operating under Horizon 2020 (June 2017).

⁵⁶ The actions underpinned by IA6 respond to the specific key strategic orientation: '29. Sustainable and circular management and use of natural resources as well as prevention and removal of pollution are mainstreamed, unlocking the potential of the bioeconomy, ensuring competitiveness and guaranteeing healthy soil, air, fresh and marine water for all, through better understanding of planetary boundaries and deployment of innovative technologies and other solutions, notably in primary production, forestry and bio-based systems.' of the Horizon Europe [2021-2024 Strategic Plan](#).

⁵⁷ In scope of the Partnership Evaluation Report: 'Circular Bio-Based Europe Joint Undertaking' Evaluation study on the European Framework Programmes for Research and Innovation for addressing Global Challenges and Industrial Competitiveness: Focus on activities related to the Green Transition.

8. Directionality

The external experts' reports recognise that, for the BBI and CBE JUs, addressing global challenges and fostering competitiveness requires a comprehensive approach that goes beyond traditional calls and work programmes³. The interviews conducted for the report highlighted the potential of the bio-based economy in marginalised areas with geographical challenges and development difficulties. It is recognised that these regions offer unique opportunities for sustainable development and economic growth. However, realising this potential requires a deep understanding of local production and social structures. Building on these premises, the JU has acknowledged the importance of aligning the worlds of agriculture, development and the bio-based economy to effectively address the complex challenges faced by European society and the European economy, including in marginalised areas facing geographical challenges and development difficulties. In addition, the interviews highlighted the need to focus on public and consumer awareness, including long-term education and awareness-raising about the bio-based economy.

As mentioned above (Section 3c), the overall complexity of integrating all these elements, is being addressed through the MAA in CBE JU programming, a new feature which is absent from the BBI. **It remains to be seen – after first projects covered by it have been completed – whether the MAA approach has been a success.**

At the same time, the continuity of delivering the IA-FLAGS, from the BBI JU to the CBE JU, facilitates the convergence of EU competitiveness – in a field aiming to replace the fossil-based economy – with the global environmental and climate objectives⁵⁸. In fact, IA-FLAGS are particularly instrumental in addressing the critical challenge known as the 'valley of death', which refers to the phase where innovative concepts face barriers in transitioning from research and development to practical implementation in the market. For example, the IA-FLAG [PLENITUDE](#)⁵⁹, produces affordable plant-based proteins (mycoproteins) for human consumption. The latest news from the project is that, when running at total capacity, the production will cut CO₂ emissions by 5 million tonnes a year compared with the production of meat proteins, consuming much less water compared to beef farming, and using agriculture waste as the main resource. However, information about the current production activities of the industrial plant (in the Netherlands) is not published on the CBE JU website.

A comprehensive and strategic communication plan is recommended by the external experts⁶⁰ to maintain the overall efficacy of the JU. BBI JU and CBE JU communication activities were carried out according to the respective communication strategies and their implementation documented in the annual activity reports, as well as in periodic reports to the Governing Board.

⁵⁸ [CBE JU A competitive bioeconomy for a sustainable future 2024 online.pdf \(europa.eu\)](#)

⁵⁹ Funded under call BBI.2018.SO3.F2 - Large-scale production of proteins for food and feed applications from alternative, sustainable sources. EUR 16.9 m EU contribution.

⁶⁰ 'External Report 2024' pages 40-42.

9. International positioning

There are neither specific objectives nor targets for collaboration with international organisations and/or entities in non-EU countries outlined in the CBE JU SRIA or in the Council Regulation establishing the CBE JU. However, the BBI/CBE JU operated/operates fully within the rules of H2020/HEU, where openness to the world is one of the principles. It is important to note that the primary objective of the CBE JU (and the preceding BBI JU) is to deploy sustainable and efficient bio-based solutions at European level. This includes establishing short sustainable supply and value chains from locally sourced bio-based feedstock. The participation of ‘third countries’ is less than 1%⁶¹.

Group of country	Number of projects	Participations		EC contribution		EC Contr. per part. (EUR 1,000)	Number of countries
		Nb	Share (%)	EUR (1,000)	Share (%)		
H2020-EU27	142	1.687	89,7%	727.879	88,6%	431,5	26
EU-14	142	1.556	82,8%	636.269	77,4%	408,9	14
EU-13	63	131	7,0%	91.609	11,2%	699,3	12
H2020-associated (exclude UK)	56	93	4,9%	50.304	6,1%	540,9	8
United Kingdom	56	94	5,0%	43.341	5,3%	461,1	1
Third Countries	5	6	0,3%	0	0,0%	0,0	4
All-countries	142	1.880	100,0%	821.523	100,0%	437,0	39

In the above table, EC=European Commission; decimal numbers use ',' and thousands '.'

In general, the efforts of the BBI/CBE JUs toward international cooperation have so far been relatively limited. Interviewees noted limited collaboration outside of Europe promoted by the BBI/CBE JUs. However, there is recognition of the potential importance of establishing future collaboration beyond Europe, and it may be advisable to explore setting up a dedicated international relations unit⁶². In addition, at programme level, the CBE JU, and previously the BBI JU, regularly cooperates with the Food and Agriculture Organization and is a member of its International Sustainable Bioeconomy Working Group (ISBWG). The CBE JU project officer also participates in key international events and congresses such as the Bioeconomy Congress on Biomass, World Bioeconomy Forum, and World Forestry Congress. **As a lesson learned, a more robust policy feedback loop from such activities into the JU programming cycle or its communication activities would be recommended.**

10. Phasing-out preparedness

According to the Single Basis Act⁶³, all JUs have the legal obligation to adopt a plan for the phasing-out of the partnership from Horizon Europe funding by the end of 2023. The aim of the plan is to ensure a smooth continuation of the JUs’ activities in the scenario of no funds available under the next Framework Programme. In this perspective, JUs are asked to perform an in-depth reflection on a phasing out strategy leading to a lesser dependence from the Union contribution.

⁶¹ ‘External Report 2024’ page 19.

⁶² ‘External Report 2024’ pages 40–42.

⁶³ [Council Regulation \(EU\) 2021/2085](#) establishing the Joint Undertakings under Horizon Europe.

CBE JU has prepared a preliminary plan which was adopted by the CBE JU Governing Board in December 2023. The preliminary plan included administrative and operational adaptations, which should allow the JU to proceed its activities in case of no Union funding under the next Framework programme. In detail, the adaptations concern several aspects, such as legal status, staffing, accounting and cashflow, procurement, logistic and IT, follow up of the grant agreement obligations after the end of projects.

The drafting of the updated phasing out plan is currently ongoing, and it is planned to be adopted in 2025. It should include concrete reflections on short- and long-term targets, strategic alignment and financial sustainability. The aim is to develop a strategy enabling the JU to obtain the objectives beyond the duration of the Union's participation.