INDICATORS AND METHODS FOR MEASURING TRANSITION TO CLIMATE NEUTRAL CIRCULARITY

Task 5: Case-study group B1

Report for: DG RTD, Directorate B – Healthy Planet, Unit B1: Circular Economy & Biobased Systems

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CONTENTS

1. INTRODUCTION

The transition to a circular economy (CE) needs to occur on multiple levels, from households and individual consumers to national and cross-border ecosystems. Measuring and monitoring the development of this transition is an ambitious task and is ideally supported by indicators relevant to all steps in that process.

This case-study is one of 19 developed for a research project into "*Indicators and methods for measuring transition to climate neutral circularity, its benefits, challenges and trade-offs*". It provides a detailed summary of the development and testing programme conducted for Group 1 of the bioeconomy sub-policy area during Task 5 of the project. The main purpose of this case study is:

1. Provide an overview of the testing and monitoring method adopted for each indicator.
2. Outline the key results and performance of each indicator.
3. Highlight any challenges or lessons learnt from the identification, planning, delivery and analysis of the relevant methodology for each indicator.

The aim of Task 5 is to take the learnings of all other Tasks thus far and develop and test the new indicators identified in Tasks 3 and 4 as having potential to enable a deeper understanding of the 3 facets of circularity for the five key approaches. This case-study is a direct output of Task 5.

This case-study focuses on the following 4 indicators outlined in Table 1.

Table 1. Overview of case-study group 1

URN		Indicator name	Methodology	Level of implementation				
				EU	National	City / Region	Companies	Household
B1	**1**	Private sector investment, number of jobs created, and gross value added related to the bioeconomy sector	• Desk based research • Material flow analysis • Stakeholder engagement			X	X	
B4	**2**	Number of products with the EU Ecolabel that are bio-based	• Desk based research	X	X			
B5	**3**	Level of engagement by companies in developing a bioeconomy, categorised by the types of activities undertaken	• Desk based research • Stakeholder engagement			X	X	
B6	**4**	Cost savings through industrial symbioses using bio-based material	• Desk based research • Stakeholder engagement			X	X	

2. INDICATOR 1 - PRIVATE SECTOR INVESTMENT, NUMBER OF JOBS CREATED, AND GROSS VALUE ADDED RELATED TO THE BIOECONOMY SECTOR

This indicator measures the following three economic facets of the bioeconomy sector at regional and company level:

- Private sector investment.
- Number of jobs created.
- Gross value added (GVA).

It is relevant to the CE as it helps monitor the economic performance of the bioeconomy sector, that is the "biological cycle" according to the Ellen MacArthur Foundation which returns nutrients to the earth via biodegradation, replenishing the soil and therefore regenerating nature[1].

There are many benefits to monitoring this indicator, for example:

- Providing insight on how the bioeconomy sector supports economic growth, economic growth being expected to be an incentive for public and private stakeholders to develop the sector.
- Supporting innovation in the CE and bioeconomy sectors.
- Complementing the new EU monitoring framework as it would support the collection of data on competitiveness and innovation.

2.1 KEY METHODOLOGY

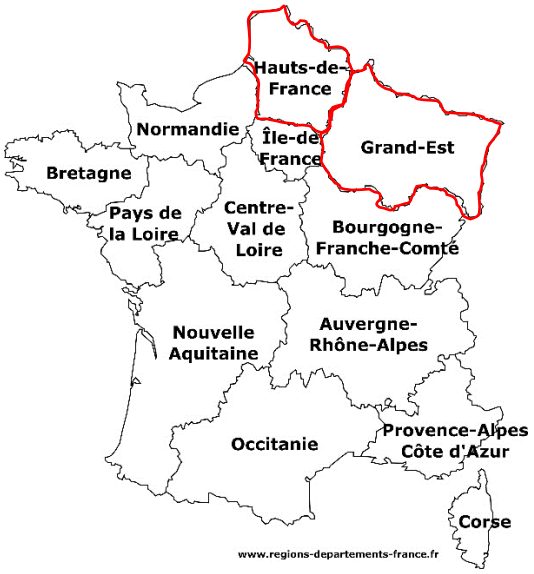
2.1.1 Testing method

France was chosen as a key territory to explore as initial desk-based research found that it has favourable conditions for the primary production of bioresources. Indeed, France is, by size, the first Useful Agricultural Area (UAA) and third forest area in the EU, and the second maritime domain in the world (République Francaise, 2016). France has also adopted a strategy to support the development of the bioeconomy sector in 2017 (République Francaise, 2018). Also, the team benefits from some native French speakers, which was expected to be valuable for the stakeholder engagement exercise planned for the data collection.

Further desk-based research found that two regions in France were leading the development of the bioeconomy sector, namely Grand Est and Hauts-de-France. Figure 1 shows a regional map of France. Indeed, in 2018, these two regions have both designated an elected representative for bioeconomy, developed a regional bioeconomy strategy and organised significant events shaping the future of the bioeconomy in their area right after the French bioeconomy strategy was launched (Conseil Général de l'Alimentation, de l'Agriculture et des Espaces Ruraux, 2019).

[1] Ellen MacArthur Foundation, The biological cycle of the butterfly diagram. <https://www.ellenmacarthurfoundation.org/articles/the-biological-cycle-of-the-butterfly-diagram>. Accessed February 2024.

Figure 1. Regional map of France



Therefore, it was decided that the testing of this indicator would be focusing on these two French regions, measuring the private sector investment, number of jobs created, and GVA for each region and for a total of three companies within these regions. This would allow to evaluate the impact of the development of a local strategy for the development of the bioeconomy sector as data will be collected before and after 2018 if possible, and also to compare the uptake of the strategy in the two different areas.

2.1.2 Data collection method

Initial desk-based research was conducted in order to identify relevant data. This showed that the data needed to build this indicator at regional level was not directly available, so it was decided that proxy data would be used instead and that a Material Flow Analysis (MFA) would be conducted. Similarly, data at company level was not available, so it was decided to conduct a stakeholder engagement exercise to fill the gap.

Material flow analysis

The following three datasets were downloaded as individual MS Excel spreadsheets from the national statistics bureau of France's website (INSEE) to be used as proxy data:[2]

- Gross Fixed Capital Formation (GFCF) by branch at current prices at country level.
- Number of full-time equivalents (FTE) jobs by branch at country level.
- GVA by branch at current prices at country level.

As these datasets did not provide data at regional level, it was decided that the share of Gross Domestic Product (GDP) at regional level would be used to split the country level data regionally. This is because GDP is a key economic indicator as are the metrics used to build the indicator. Therefore, the following dataset was also downloaded as individual MS Excel spreadsheet from the INSEE's website:

- GDP at country and regional level (Grand Est and Hauts-de-France).

[2] INSEE, Home page. <https://www.insee.fr/en/accueil>. Accessed February 2024.

Table 2 below lists the sources for these four datasets.

Table 2. List of data sources

Type	Source	Quality	Extraction date
GDP[3]	INSEE	Good	26/02/2024
GFCF[4]	INSEE	Good	16/02/2024
Number of FTE jobs [5]	INSEE	Good	16/02/2024
GVA[6]	INSEE	Good	16/02/2024

These four spreadsheets were then combined into one master spreadsheet where calculations were made to estimate the indicator. This document can be found in Appendix 6.1.

Historic data was readily available, so it was decided to monitor the indicator over the last 10 years (from 2012 until 2022, date of the latest data available).

Stakeholder engagement exercise

Relevant organisations were identified using a dedicated bioeconomy database created by the Grand Est region[7]. The list of the over 40 organisations contacted was recorded using MS Excel and can be found in Appendix 6.3. The following information was gathered:

- Type of organisation (public organisation, trade body or business).
- Name of the organisation.
- Name of a contact within the organisation if available.
- Email address or link to contact form.
- List of data required.
- Whether if the stakeholder was contacted and when.
- Whether if the stakeholder was chased and when.
- Whether if the stakeholder answered and when.
- Whether if the answer was useful for this indicator or not.

These organisations were contacted in French either directly via email where available using MS Outlook or through the contact form found on their website. An example of the emails sent can be found in Appendix 6.4.

A data collection template created using MS Excel and written in French was sent to the organisations identified when the relevant contact was found. It presented the project and requested level of investment, number of jobs created and GVA data at company level yearly for the last 10 years. This document can be found in Appendix 6.5.

This stakeholder engagement exercise took place throughout the month of February 2024 and organisations who did not answer the initial email were sent a reminder at least once by email where feasible.

2.1.3 Calculations

The following calculation was performed on the GDP dataset to obtain the regional share of GDP:

$$\frac{GDP\ at\ regional\ level_{Year\ N}}{GDP\ at\ country\ level_{Year\ N}} = Regional\ share\ of\ GDP_{Year\ N}$$

[3] INSEE, Produits intérieurs bruts régionaux et valeurs ajoutées régionales de 1990 à 2022. <https://www.insee.fr/fr/statistiques/5020211>. Accessed February 2024.

[4] INSEE, Les comptes de la Nation en 2022. <https://www.insee.fr/fr/statistiques/7455994>. Accessed February 2024.

[5] INSEE, Emploi en 2022. <https://www.insee.fr/fr/statistiques/7455955>. Accessed February 2024.

[6] INSEE, Valeur ajoutée et rémunération en 2022. <https://www.insee.fr/fr/statistiques/7455951>. Accessed February 2024.

[7] Bioéconomie Grand Est, Carte des acteurs de la bioéconomie. <https://www.bioeconomie-grandest.fr/acteurs/>. Accessed January 2024.

Table 3 below shows the results of these calculations.

Table 3. Regional share of GDP

Title	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Grand Est	7.2%	7.2%	7.1%	7.1%	7.0%	7.0%	6.9%	6.9%	6.9%	6.8%	6.9%
Hauts-de-France	7.4%	7.3%	7.3%	7.3%	7.2%	7.2%	7.2%	7.1%	7.2%	7.1%	7.2%
France	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

The following calculation was performed on the GFCF, number of FTE jobs and GVA datasets to obtain regional level data:

$$Country\ level\ data_{Year\ N}\ x\ Regional\ share\ of\ GDP_{Year\ N} = Regional\ level\ data_{Year\ N}$$

The following additional calculation was performed in the number of FTE jobs dataset to obtain the number of FTE jobs created:

$$Regional\ number\ of\ FTE\ jobs_{Year\ N} - Regional\ number\ of\ FTE\ jobs_{Year\ N-1} = Regional\ number\ of\ FTE\ created_{Year\ N}$$

Finally, for each of these three datasets, the data for the relevant branches (see Section 0 for more details) were calculated using the MS Excel formula "=SUM()" to obtain bioeconomy sector data.

Results of these calculations are provided in Section 2.2.

2.1.4 Timeline

Table 4 below shows the Gantt chart highlighting the testing timeline.

Table 4. Gantt chart

w/c	08/01	15/01	22/01	29/01	05/02	12/02	19/02	26/02	04/03	11/03	18/03	25/03
Define system boundary												
Desk-based research												
Develop methodology												
Stakeholder engagement												
Case study writing												
Review period									Phase 1		Phase 2 & 3	
Key deliverables								Case study		Case study		Case study

2.1.5 Data gaps and mitigation

Table 5 below summarises the identified data gaps, and outlines the strategy used to mitigate the gaps and still obtain meaningful insights.

Table 5. Overview of identified data gaps, limitations and mitigation efforts

	Description of data gap	Mitigation efforts	Level of confidence
1	Data on private sector investment at regional level was not readily available.	• The GFCF by branch at current prices at country level was used instead as a proxy data. • The GDP at national and regional level was used as a key to split the country level data into regional level data.	High
2	Data on number of jobs created at regional level was not readily available.	• The number of FTE jobs by branch at country level was used instead as a proxy data. • The GDP at national and regional level was used as a key to split the country level data into regional level data.	High
3	Data on GVA at regional level was not readily available.	• The GVA by branch at current prices at country level was used instead as a proxy data. • The GDP at national and regional level was used as a key to split the country level data into regional level data.	High

4	Data for the bioeconomy sector at regional level only was not readily available.	• A conservative approach was used to select the branches related to the bioeconomy sector.
		• It was assumed that the following three sectors were certainly related to the bioeconomy sector:
		  ○ Agriculture, forestry and fishing.
		  ○ Manufacture of food, beverages and tobacco products.
		  ○ Woodworking, paper industries and printing.
		• Any other branches were thought to not be related to the bioeconomy sector in a relevant enough way for this study. For example, it is expected that the chemical and pharmaceutical branches have some level of relevance to the bioeconomy sector, however it was not possible to find out how significant they were related to it, so we decided to not include them in our analysis.
			High

5	Data at company level was not available.	• A stakeholder engagement exercise was conducted to collect data. Over 40 organisations were contacted.	High
6	The stakeholders contacted either did not answer, or they could not provide the information needed.	• Stakeholders contacted were chased at least once where feasible. • No other solution could be found, this part of the indicator could not be calculated.	Low

2.1.6 Quality review of analysis

To ensure robust and high-quality results, the following data validation and quality control procedures were followed:

- Prior to work beginning, the Project Director reviewed the proposed research methodology and ensured that the data collection plan was fit for purpose. Once the research team had addressed any comments from the review process, they proceeded to the data collection phase.
- The Project Manager or a delegate reviewed the work done.
- The Quality Assurance Manager held responsibility for the quality of the final case study output. The Project Manager assisted the Quality Assurance Manager in judging the quality of the output and suggesting ways to improve.

2.2 KEY ANALYSIS RESULTS

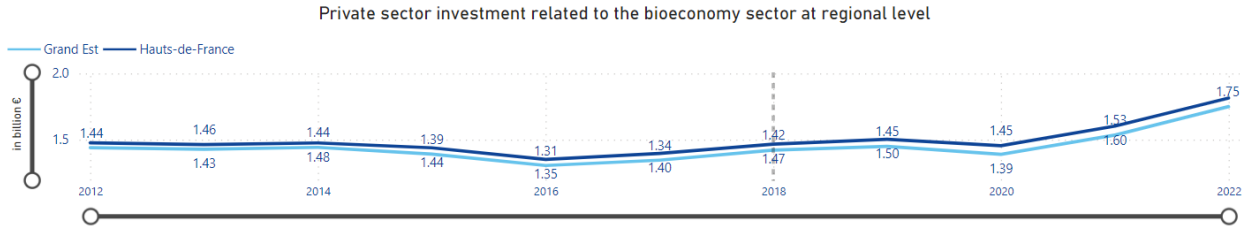
Please note that due to the lack of data at company level, analysis could only be conducted at regional level.

2.2.1 Analysis

Private sector investment related to the bioeconomy sector at regional level

Figure 2 below presents the amount of private sector investment related to the bioeconomy sector for the French regions of Grand Est and Hauts-de-France between 2012 and 2022 in billion €. It shows that the private sector investment related to the bioeconomy sector was rather steady between 2012 and 2019, and that it started to increase from 2020, two years after the regional bioeconomy strategies were developed. It also shows that trends and values are similar in both regions. This shows a clear improvement in investment following the development of regional bioeconomy strategies. This implies that such strategies are effective in stimulating the bioeconomy and highlights the need for continued support, including policy incentives, research and development funding, and collaboration between public and private sectors, to maintain momentum and address any emerging challenges.

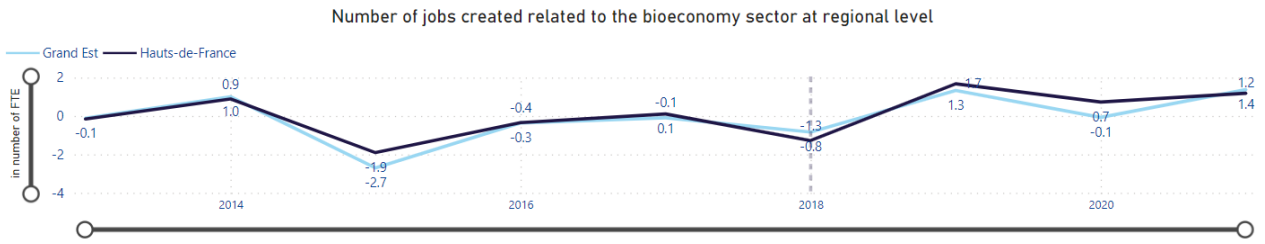
Figure 2. Private sector investment related to the bioeconomy sector at regional level between 2012 and 2022 (in billion €)



Number of jobs created related to the bioeconomy sector at regional level

Figure 3 below presents the number of jobs created related to the bioeconomy sector for the French regions of Grand Est and Hauts-de-France between 2013 and 2021 in number of FTE. Please note that 2012 and 2022 data were not available for this part of the indicator either due to the methodology used for calculations or a lack of data availability. It shows that the number of jobs created related to the bioeconomy sector was negative between 2013 and 2018, and that it became positive from 2019, the year after the regional bioeconomy strategies were published. It also shows that trends and values are similar in both regions. This shows a clear improvement in job creation following the development of regional bioeconomy strategies. This implies that such strategies are effective in stimulating the bioeconomy and highlights the need for continued support, including policy incentives, research and development funding, and collaboration between public and private sectors, to maintain momentum and address any emerging challenges.

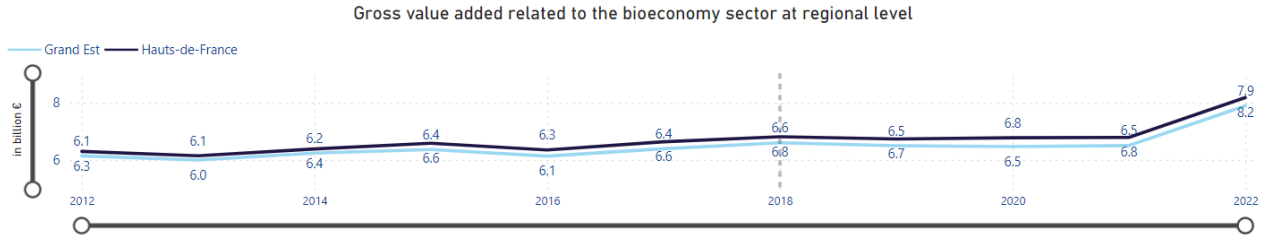
Figure 3. Number of jobs created related to the bioeconomy sector at regional level between 2013 and 2021 (in number of FTE)



Gross value added related to the bioeconomy sector at regional level

Figure 4 below presents the amount of GVA related to the bioeconomy sector for the French regions of Grand Est and Hauts-de-France between 2012 and 2022 in billion €. It shows that the GVA related to the bioeconomy sector was slowly increasing between 2012 and 2020 with a significant uptake from 2021, three years after the regional bioeconomy strategies were published. It also shows that trends and values are similar in both regions. The observed patterns suggest that investments in the bioeconomy sector have a delayed payoff with significant increases in GVA only becoming apparent after several years. This indicates that the bioeconomy requires time to mature and that long-term investment is crucial for realising its full economic potential.

Figure 4. Gross value added related to the bioeconomy sector at regional level between 2012 and 2022 (in billion €)



2.2.2 Limitations

The limitations associated with this data include the following:

- Regional data was not available, so the GDP was used to split the country level data. This means that regional data were estimated by proxy and therefore results from the calculation of this indicator are not fully accurate.
- Data for the bioeconomy sector specifically was not available, so a conservative approach was used to select relevant branches, omitting some potential bioeconomy related data in sectors such as chemical and pharmaceutical.

2.2.3 Performance

Table 6 below describes how this indicator performs against the RACER evaluation following testing and compares this performance against its original RACER assessment. Details on the scoring are available in Appendix 6.1. The original RACER assessment for this indicator gave it a total score of 12 out of 15, but following testing the score came at 14 out of 15:

- **Relevance**: Testing showed that the indicator was relevant to the bioeconomy sector as trends seem to have been impacted by significant events related to the sector. It was therefore decided that the rating would change from 2 to 3.
- **Acceptability**: The original assessment for this criterion was 3 and after testing it was decided to keep it unchanged as private sector investment, number of jobs created, and GVA are still considered to be broadly accepted metrics.
- **Credibility**: Given the fact that data was mostly readily available from the INSEE's website, this criterion was rated 3 after testing instead of 2.
- **Ease**: This criterion was left unchanged after testing as it showed that the three metrics are broadly understood, available and easy to use.
- **Robustness**: The original assessment gave a score of 2 for this criterion, which was left unchanged as some simple proxy and estimations were required to obtain data at regional level for the bioeconomy sector.

Table 6. RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	2	3	2	3	2	12
After Task 5 (following testing)	3	3	3	3	2	14

2.3 CHALLENGES AND LESSONS LEARNED

2.3.1 Challenges

Stakeholder engagement

The main challenge faced during the monitoring process was the lack of engagement from the over 40 stakeholders engaged with to obtain regional and company level data specific to the bioeconomy sector. This challenge was partly mitigated by using proxy data at country level to estimate regional data for the bioeconomy sector. However, no mitigation solution could be found to address this issue at company level and this part of the indicator could not be calculated.

This lack of engagement could be symptomatic of a broader issue, such as a lack of awareness of the bioeconomy's importance, perceived burdens of data sharing or concerns over data privacy and competitive advantage.

Use of proxy data

As mentioned above, to mitigate the lack of engagement from key stakeholders, proxy data was used to estimate regional data which might introduce inaccuracies.

2.3.2 Lessons learned

The data collection method could be improved if the data collected by the INSEE would show regional level as well as country level and would be presented per sector rather than per branch. It is expected that these data could be easily available, using business's location and sector to split the data. Also, promoting standardised data formats across the industry should help streamline the data collection process.

Different measures are needed to support data collection at company level, such as legislative development or facilitation, economic or commercial incentivisation, technical guidance, support on data collection and reporting (e.g. providing a dedicated portal). This could include subsidies, tax credits, rewards and case studies.

2.4 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is considered for further development, with minor work required to facilitate its progress.

It is expected that this indicator is suitable for further development across the EU as it was shown to be relevant to the bioeconomy sector and therefore to the CE, as its metrics (private sector investment, number of jobs created, and GVA) are objective, replicable and widely accepted. Also, this indicator's sources are credible and reliable as data either comes from national databases or is collected from businesses themselves. Finally, this indicator is already robust, direct and readily available, although its robustness and availability could be enhanced through the minor data collection method improvements mentioned in Section 2.3.2.

The main finding following testing is that it appears to exist a positive link between the development of national and regional bioeconomy strategies and the increase in the private sector investment, number of jobs created, and GVA related to the bioeconomy sector at regional level. This shows that this indicator is relevant to monitoring the evolution of the bioeconomy sector and therefore the impact of the CE.

Although regional level data was mostly readily available with some minor changes needed to allow for a direct data collection (presenting data at regional level and per sector), it was not the case at company level and no data was available for testing this part of the indicator. It is therefore recommended that either legislative development or facilitation, economic or commercial incentivisation, technical guidance, support on data collection and reporting, or any other similar measures are set up to support companies collating data.

It is not expected that this indicator would involve future data requirements as the metrics are already well established and only the data collection methods need to be improved. It is also not expected that targets should be set for this indicator. It is rather recommended that this indicator is measured over time and compared to other sectors that are not related to the CE (e.g. oil and gas extraction) to monitor CE progresses over the linear economy.

It is expected that improving communication to organisations and to the public around the CE and the bioeconomy and developing relevant strategies would improve the measurement of this indicator (as data would be better collected) as well as its actual value as more private sector investment would be made, more jobs would be created, and more value would be added to the bioeconomy sector.

Following the testing of this indicator, it was found that its original name 'Private sector investment, number of jobs created, and gross value added related to the bioeconomy sector' was fit for purpose and that no variation was needed.

Finally, this indicator would complement the new EU monitoring framework as it would support the collection of data on competitiveness and innovation through the private investment, jobs and GVA related to CE sectors indicators.

Table 7: Summary of recommendations for indicator B1

Type of recommendation	Recommendation	RACER criteria addressed	Timeline	Key stakeholders or partners
Legislation	Improve national statistics databases so regional and bioeconomy sector data is readily available	Robustness	Short (0.5 – 1.5 years)	Responsible: EC Accountable: national statistics organisations Consulted: relevant trade bodies Informed: relevant companies
Legislation	Support data collection at company level	Robustness	Medium (1.5 – 5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies
Economic or commercial incentivisation	Support data collection at company level	Robustness	Medium (1.5 – 5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies
Technical guidance, support on data collection and reporting	Support data collection at company level	Robustness	Medium (1.5 – 5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies
Technical guidance, support on data collection and reporting	Develop and adopt standard data formats and protocols for the bioeconomy sector to facilitate data sharing and integration across Member States, regions and companies.	Robustness	Short (0.5 – 1.5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies
Technical guidance, support on data collection and reporting	Implement capacity building and training programmes for stakeholders in the bioeconomy sector to improve data literacy, collection and reporting practices.	Robustness	Short (0.5 – 1.5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies

Type of recommendation	Recommendation	RACER criteria addressed	Timeline	Key stakeholders or partners
Communication	Support overall data collection and the bioeconomy sector in general	Robustness	Short (0.5 – 1.5 years)	Responsible: Member States Accountable: regional public organisations Consulted: relevant trade bodies Informed: relevant companies and public

3. INDICATOR 2 - NUMBER OF PRODUCTS WITH THE EU ECOLABEL THAT ARE BIO-BASED

This indicator focuses on the number of bio-based products certified with the EU Ecolabel across EU member states and for the EU as a whole.

The EU Ecolabel[8], recognised worldwide, certifies products with a guaranteed, verified low ecological impact. Throughout their life cycle, from raw material extraction through to production, distribution and disposal, goods and services must satisfy high environmental standards to meet its requirements. Its aim is to help consumers, retailers and business make truly sustainable choices. As of February 2024, there are 88,921 products (goods and services) which have been awarded an EU Ecolabel.

The term 'bio-based' can be defined as a product which is made entirely or partly of a living (or once living) organism. This is of significant relevance to the CE because bio-based materials are considered as renewable resources which are also biodegradable and can therefore feed back into the CE as a biological cycle. It is useful for identifying circularity when linked to bio-based material because increasing the use of bio-based materials avoids the extraction of non-bio-based, non-renewable, hard to recycle/non degradable resources.

There are many benefits to monitoring this indicator, for example:

- Aiding the understanding of the amount of biodegradable and renewable products under the EU Ecolabel.
- Supporting determining whether a product can be considered 'bio-based'.
- Supporting identifying circularity where materials can be recycled within the biological cycle.

3.1 KEY METHODOLOGY

3.1.1 Testing method

This indicator focuses on all EU member states and on individual countries. The EU Ecolabel e-catalogue[9] identifies the country where each product is based, meaning this does not account for where the product is manufactured or sold. Transnational differences are not expected to influence the results of this indicator. However, due to the large number of products available, five countries were selected to be in the spatial scope, this way the volume of products to be tested was achievable without compromising the spread of EU Ecolabel categories within the dataset. The sample tested a range of product categories including cosmetic products, dishwasher detergents, graphic paper, handwashing detergents, hard surface cleaning products, indoor and outdoor paints and varnishes, laundry detergents, textile products and tissue paper/tissue products.

All data since the establishment of the EU Ecolabel in 1992 until present have been included in this methodology as the EU Ecolabel e-catalogue includes all products which have been awarded an EU Ecolabel.

Only goods and services EU Ecolabel products are included in this indicator, meaning the Tourist accommodation licenses have been excluded. This is because they do not account for bio-based materials. There are 11 product categories within the goods and services EU Ecolabel e-catalogue which range from clothing and textiles to cleaning products. All product categories are included in the indicator.

However, due to the large number of EU Ecolabel products (88,921), we are unable to test all products, countries or categories. Therefore, a sample of 217 (0.24%) products were tested. The sampling method is explained below in Section 3.1.2.

3.1.2 Data collection method

The product, country and whether the product is bio-based or not was recorded using MS Excel.

[8] EC, About the EU Ecolabel. <https://environment.ec.europa.eu/topics/circular-economy/eu-ecolabel/about-eu-ecolabel_en>. Accessed February 2024.

[9] EC, EU Ecolabel e-catalogue. <https://app.powerbi.com/view?r=eyJrIjoiMzAyMzVkNWMtNmJhOS00ZDg4LWIzMTItNzczMDkwODBiNjRmIiwidCI6ImIyNGM4YjA2LTUyMmMtNDZmZS05MDgwLTcwOTI2ZjhkZGRiMSIsImMiOjh9>. Accessed February 2024.

Table 8 contains the information on the sources used to collect data. EU Ecolabel product data to support this data collection was sourced and retrieved from the EU Ecolabel e-catalogue. To determine whether the products tested were bio-based, a general internet search with the product name and company name was conducted. The results of this search aim to provide information on the material/ingredient composition on the product to determine whether the product had any bio-based input. These sources may include product specifications, product website, seller websites, and company websites.

Table 8. Data sources used for the data collection method.

Data	Source
Products with the EU Ecolabel	The EU Ecolabel e-catalogue (European Commission) Microsoft Power BI
Product composition such as materials/ingredients	Product technical specifications Product websites Company website Online shops (from seller websites)

To identify the sample, several countries, with geographical spread, were selected to provide a varied range of results. The sample was picked by country to avoid bias on product categories, as some categories would yield more bio-based products that others (e.g. wood products, paper, textiles etc). The countries selected were Cyprus, Slovenia, Ireland, Norway and Luxembourg.

To identify whether the products were bio-based or not, the product was rated either Yes, No, Unknown or Untraceable. These four categories are explained in more detail below:

- Yes (Y) – Bio-based material/ingredients in the final product. This includes any level of bio-based material (even if it is 1% bio-based). This does include any bio-based products used to create the product, as well as the final product composition.
- No (N) – No bio-based materials/ingredients used to make this product.
- Unknown (Uk) – Unable to source information to determine whether the product is bio-based, as the composition of the product was unknown.
- Untraceable (Ut) – Unable to trace the product during the online search.

Data was recorded within an MS Excel template. Data for the following parameters was collected:

- Awarding country (country where the EU Ecolabel was issued).
- Company country (country where the product is made).
- Product (name of product).
- Bio-based (did the product include any bio-based material/ingredient – Yes, No, Unknown, Untraceable).
- Source (source of information where data was found).
- Type of bio-based product (any information recorded on material type and % bio-based).
- Comments (including challenges faced, data gaps, mitigations, assumptions etc.

3.1.3 Calculations

For each country and for the EU as a whole, the total for each category (Yes, No, Uk, Ut) was calculated as well as a percentage of total.

3.1.4 Timeline

Table 9 below shows the Gantt chart highlighting the testing timeline.

Table 9. Gantt chart

w/c	15/01	22/01	29/01	05/02	12/02	19/02	26/02	04/03
Build excel model for desk-based research and sample								
Collect data - research products and input results into the model								
Analyse results and conduct final calculations								
Write up case study								
Review period						Phase 1 & 2	Phase 3	
Key deliverables					Case study			Case study

3.1.5 Data gaps and mitigation

Despite all EU Ecolabel products being available through the catalogue database, there were still some data gaps present within this indicator. The identified data gaps and mitigation strategies are included in Table 10. Gaps in the data available meant that proxy data and alternative data was sourced and incorporated into the indicator data.

Table 10. Overview of identified data gaps, limitations and mitigation efforts

	Description of data gap	Mitigation efforts	Level of confidence
1	Potential lack of data on product composition to identify whether bio-based or not.	• Search for multiple sources of proxy/alternative data such as product specifications, product websites, seller websites (e.g. online shops), company information etc. • Use of expert judgement to make assumption on whether a product could be bio-based or not without the detailed product composition information.	Medium
2	Potential lack of clear data on whether a products material or ingredients are bio-based.	• Conduct wider research into material/ingredient to determine if it is bio-based. Use academic sources, general search engine results and grey literature.	High
3	The data provided in the EU Ecolabel e-catalogue may not be sufficient to find the product information e.g. company name and product name do not result in finding the product online.	• Conduct wider research into the company and aim to locate the product through a reseller website (e.g. online shop). • If unable to be found, the product will be recorded as Ut in the data collection table.	Low

3.1.6 Quality review of analysis

To ensure robust and high-quality results, the following data validation and quality control procedures were conducted:

- Prior to beginning, the Project Director reviewed the proposed research methodology and ensured that the data collection plan was fit for purpose. Once the research team addressed any comments from the review process, they proceeded to the data collection phase.
- Data being used in this project has already been validated pre-publication, however following the running of calculations these were reviewed and validated by the Bioeconomy Indicators' Lead and Ricardo's in-house Quality Assurance Manager.

3.2 KEY ANALYSIS RESULTS

3.2.1 Analysis

A breakdown of the key results can be seen in Table 11, Table 12 and Figure 5.

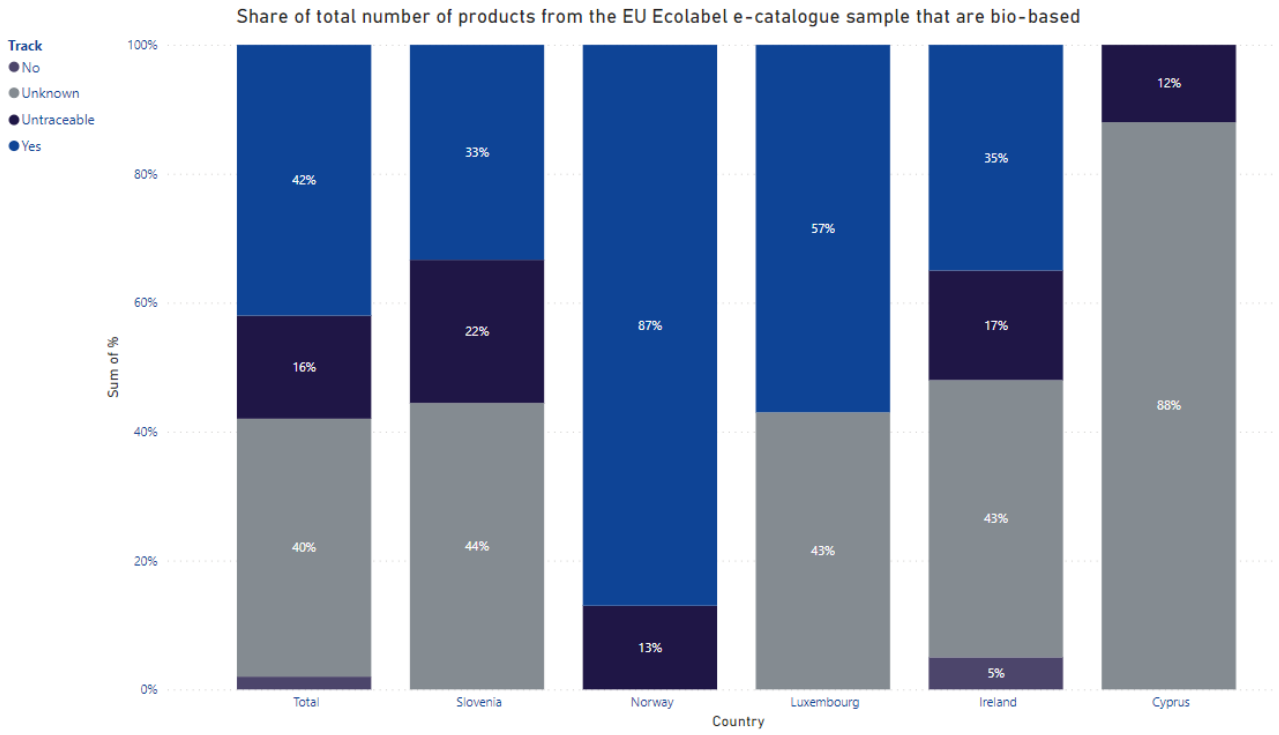
Table 11. Results of the count of bio-based products from the EU Ecolabel e-catalogue sample

Awarding Country	No. products tested	Total Yes	Total No	Total Unknown	Total Untraceable
Cyprus	33	0	0	29	4
Ireland	98	34	5	42	17
Norway	52	45	0	0	7
Slovenia	27	9	0	12	6
Luxembourg	7	4	0	3	0
Total	**217**	**92**	**5**	**86**	**34**

Table 12. Share of total number of products from the EU Ecolabel e-catalogue sample that are bio-based

Awarding Country	No. products tested	Total Yes	Total No	Total Unknown	Total Untraceable
Cyprus	100%	0%	0%	88%	12%
Ireland	100%	35%	5%	43%	17%
Norway	100%	87%	0%	0%	13%
Slovenia	100%	33%	0%	44%	22%
Luxembourg	100%	57%	0%	43%	0%
Total	**100%**	**42%**	**2%**	**40%**	**16%**

Figure 5. Share of total number of products from the EU Ecolabel e-catalogue sample that are bio-based



The full results of the indicator analysis can be found in Appendix 6.6.

There were a number of trends in the data:

- 92 (42%) of the total products tested were bio-based, with Norway having the largest number at 45 products classified as bio-based (49% of total products classified as bio-based). This suggests a strong focus or preference for bio-based products within the products tested in Norway, possibly indicating either a market trend or possibly a specific regulatory or certification push within the country. Ireland, Slovenia and Luxembourg recorded 34, 9, 4 and 0 respectively. The presence of bio-based products in most country's sample, especially the high percentage in Norway, indicates a growing interest and potential for the expansion of bio-based products within the EU market, and reinforces the importance of this type of indicator.
- 86 (40%) of the total products tested recorded an ‘Unknown’ result. This was likely due to the limitations in data available resulting in being unable to confirm if there were any bio-based materials within the specified product.
- 34 (16%) of the total products were classed as ‘Untraceable’ because the products were unable to be traced online. This may be due to them being discontinued or the EU Ecolabel being discounted.
- The variability in the number of bio-based products and the distribution of 'Unknown' and 'Untraceable' among different countries suggests market variability in the adoption and certification of bio-based products. This could be influenced by national policies, market demand or the presence of industries specialising in bio-based products.
- 5 (2%) of the total products were recorded as having no bio-based material. In these instances, there were no bio-based materials/ingredients used to make this product as per the product specifications.

3.2.2 Limitations

The key limitations to the results are summarised below.

- The sample size of the data is very small compared to the total number of EU Ecolabel products. 217 out of 88,921 (0.24%) products were tested, meaning not all the awarding countries and product categories were included in the sample. This means that the results are not representative of the whole EU Ecolabel e-catalogue, and just provide an insight into how future monitoring could determine the number of bio-based products.
- Due to the data gaps explained in Section 3.1.5 missing data has meant that not all products were able to be confidently categorised as bio-based or not. Therefore, a large number of products across all countries were classified as 'Unknown', highlighting the challenges in accessing detailed information on the bio-based content of products. This highlights a significant data gap and underscores the need for improved transparency and information availability regarding product compositions.
- The 'Untraceable' category shows notable variance across countries. Ireland, in particular, has a relatively high number which could suggest a dynamic market where products are frequently updated, replaced or discontinued.
- The spatial spread of the sample is not representative of the whole EU Ecolabel e-catalogue with just 5 countries out of 27 awarding countries being tested.

3.2.3 Performance

Table 13 displays the RACER evaluation for before and after the testing phase. Details on the scoring are available in Appendix 6.1. Before the testing phase was completed, the relevance was high with a score of 3, and acceptability, credibility, ease and robustness were rated medium with a score of 2.

However, after the testing method was complete, the relevance, acceptability and credibility are all rated highly with a score of 3. This is due to the nature of the EU Ecolabel being widely used across the EU, its recognition, and its strong links to CE through the 'bio-based' element of this indicator.

The ease of testing has been ranked low with a score of 1. This is due to the data gaps, assumptions made, issues within the datasets and the amount of time needed to conduct wider research into whether the product is 'bio-based'.

The robustness has been ranked 2 due to the challenges and limitations faced in the data collection, and the various assumptions which needed to be made. It was not downgraded as once the data was collected; the methodology was easy to implement.

Table 13. RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	3	2	2	2	2	11
After Task 5 (following testing)	3	3	3	1	2	12

3.3 CHALLENGES AND LESSONS LEARNED

3.3.1 Challenges

There were multiple challenges faced during the testing process. These were addressed throughout the process and mitigations were made where possible (see Table 10). The key challenges are listed below:

- The most common challenge faced in this monitoring process was finding a data source that included available product ingredient/material description, which meant that we were unable to make a definitive assumption as to whether there were any bio-based products listed. To mitigate this, research outside of the usual product specifications and company websites was conducted. For example, many of the EU Ecolabel paints awarded by Cyprus stated they include Polyurethane ingredients, so research was conducted on this chemical group to help identify the composition of the product. After research into academic papers, the sources suggest that as a group, these chemicals are not always bio-based and mostly highlight the lower toxicity to the environment. It was therefore not able to be concluded if the paint products were bio-based or not, resulting in an 'Unknown' result.
- In some cases, we could assume that a product contained bio-based material where there were descriptive words on the product composition in the product name such as organic, cotton, wool, wood etc. This is because the nature of this name means it may be assumed to come from a bio-based product. In these cases, assumptions were made when the product specifications were unable to be found due to the data gaps, and the product was classed as 'Yes' without the confirmation of the product material list. This may not produce accurate results if the name is misleading.
- Data gaps are common amongst products that seem to fall under the same brand, for example 'KHP' cleaning products in Ireland where a company website ceased to exist. This suggest that the EU Ecolabel website may not be completely updated with products that aren't in the consumer rotation anymore.
- Despite mitigations of a fair sample (by avoiding picking product categories to test), there still may be data bias on the countries selected. Some countries had a majority of a certain product group (such as Norway being majority textiles) meaning there was still a low range of product categories within the final results.

3.3.2 Lessons learned

Lessons learnt were recorded in the data collection sheet through the process of creating this indicator. These may be applied to inform future assessments of the EU Ecolabel indicator.

- A longer timeline or additional resource for data collection would be required to gain not only a larger data pool, but each product would have a longer research window to source data on ingredients/materials that could have potentially been missed due to the time constraints.
- The EU Ecolabel e-catalogue may require additional or more detailed information to in order to locate the product online. In some cases, the product name was too indistinct and did not have enough information to research the product, producing no results when searched online. The companies listed with the products are often large corporations and the individual products are not able to be sourced online. For example, searching for "Flat Sheet" produced by Adamjee Enterprises did not yield any product data, and was therefore classed as Ut despite attempts to access the company website, factory website and online sellers (such as Amazon).
- Companies should aspire to be transparent with the materials/ingredients, such as making this data available to the public in product specifications. Despite the mitigation method of researching outside of the product specifications, it was still difficult to identify the composition of some products. This should therefore be made more widely available to consumers and close data gaps for future assessments.

3.4 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is considered for further development, with minor work required to facilitate its progress.

This indicator has highlighted that recording the number of EU Ecolabel products which are bio-based has multiple limitations and challenges to ensure robust results. The results showed that 42% of the 217 products tested were bio-based. 56% of the total products tested were either 'Unknown' or 'Untraceable' due to large data gaps and availability of EU Ecolabel information.

For further development of this indicator across the EU, it is recommended that:

- The EU Ecolabel product catalogue could include more descriptive names of the products, or a webpage link to the product specification due to the difficulties discussed around locating the EU Ecolabel products online. This will allow consumers to find the products with an EU Ecolabel.
- A percentage threshold for the criteria of whether a product is bio-based or not should be developed. This indicator method counted any percentage of bio-based material resulted in a product being classed as a bio-based product. However, to fully investigate the impact a bio-based product has on the bioeconomy and the wider CE, it is important to determine how much of the product should be biologically derived before being classed as bio-based. A suggestion would be if a product is >50% bio-based, it is classified as a bio-based product.
- The EU Ecolabel e-catalogue may require updating before further development of this indicator due to some products not being found (which may suggest they have been discounted or discontinued) and some duplicates potentially due to errors in the upload.
- For the enhancing the EU Ecolabel e-catalogue usability, perhaps also consider the integration of a search function that allows consumers to filter products based on specific sustainability criteria including bio-based content.
- Potential ways of legislative facilitation may include creating a law to ensure companies with EU Ecolabel products list all materials/ingredients of the product composition as a mandatory obligation. They should also identify if the product is bio-based or not and make this data available to consumers. This will allow consumers to make more informed choices with regard to the bioeconomy and will ensure data gaps are closed for the future EU Ecolabel indicators.

Overall, this indicator is likely to be suitable for further development across the EU. This is because the EU Ecolabel is already a credible and reputable EU metric for the environment. It is useful for identifying circularity when linked to bio-based material because increasing the use of bio-based materials avoids the extraction of non-bio-based, non-renewable, hard to recycle/non degradable resources. Therefore, if data is improved and product material availability is universally available across the EU, it could be suitable for development as metric.

Following the testing of this indicator, it was found that its original name 'Number of products with the EU ecolabel that are bio-based' was fit for purpose and that no variation was needed.

This indicator would complement the new EU monitoring framework as it would support the collection of data on secondary raw materials through the circular material use rate indicators.

Please note that while bio-based products are generally more sustainable than non-bio-based products, their environmental benefits can vary widely based on factors like land use changes, agricultural practices and processing technologies. Therefore, the lifecycle impacts of bio-based versus non-bio-based products should also be considered.

Table 14: Summary of key recommendations for indicator B4

Type of recommendation	Recommendation	RACER criteria addressed	Timeline	Key stakeholders or partners
Development of data	The EU Ecolabel e-catalogue could include more descriptive names of the products, or a webpage link to the product specification due to the difficulties discussed around locating the EU Ecolabel products online. This will allow consumers to find the products with an EU Ecolabel.	Ease and Robustness	Short (0.5 – 1.5 years)	Responsible: EC Accountable: Manufacturers Consulted: Trade bodies Informed: Consumers
Research and development	Establishing a clear threshold and clear guidelines and testing methods to assess bio-based content.	Ease and Robustness	Short (0.5 – 1.5 years)	Responsible: EC Accountable: Manufacturers Consulted: Trade bodies Informed: Consumers
Development of data	The EU Ecolabel e-catalogue may require updating before further development of this indicator due to some products not being found (which may suggest they have been discounted or discontinued) and some duplicates potentially due to errors in the upload.	Ease and Robustness	Short (0.5 – 1.5 years)	Responsible: EC Accountable: Manufacturers Consulted: Trade bodies Informed: Consumers
Legislation	Legislation required to ensure companies with EU Ecolabel products list all materials / ingredients of the product composition as a mandatory obligation. They should also identify if the product is bio-based or not and make this data available to consumers. This will allow consumers to make more informed choices with regard to the bioeconomy and will ensure data gaps are closed for the future EU Ecolabel indicators.	Ease and Robustness	Medium (1.5 – 5 years)	Responsible: EC Accountable: Member States Consulted: Trade bodies Informed: Manufacturers

4. INDICATOR 3 - LEVEL OF ENGAGEMENT BY COMPANIES IN DEVELOPING A BIOECONOMY, CATEGORISED BY THE TYPES OF ACTIVITIES UNDERTAKEN

The aim of this indicator is to measure in hours the time spent by companies in the private sector engaging with other organisations in order to develop a local bioeconomy. This measurement is split per type of engagement activity (e.g. one-to-one individual meeting, virtual group meeting) to provide a better granularity to the analysis.

Measuring the level of engagement needed from businesses in the private sector to develop a local bioeconomy is relevant to the CE as it will help businesses and regulators understand the level of investment they would need to develop a local network supporting the biological cycle (i.e., the bioeconomy) and potentially creating industrial symbiosis.

There are many benefits to monitoring this indicator, for example:

- Helping inform strategy planning at business level.
- Providing information to regulators on where they can support this engagement to reduce the time spent by businesses and provide efficiency in the networking task by focusing their effort where it is more needed (e.g. supporting the organisation of bioeconomy conferences, hosting a database of businesses in the bioeconomy sector).

4.1 KEY METHODOLOGY

4.1.1 Testing method

France was chosen as a key territory to explore as initial desk-based research found that it has favourable conditions for the primary production of bioresources. Indeed, by area, France is the first Useful Agricultural Area (UAA) and third forest area in the EU, and the second maritime domain in the world (République Francaise, 2016). France has also adopted a strategy to support the development of the bioeconomy sector in 2017 (République Francaise, 2018). Also, the team benefits from some native French speakers, which was expected to be valuable for the stakeholder engagement exercise planned for the data collection.

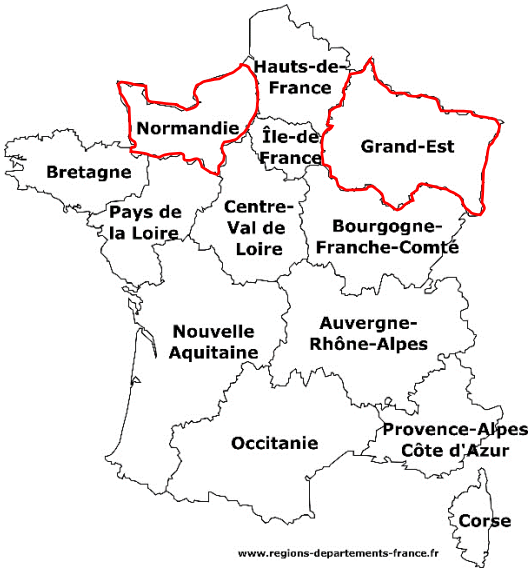
Further desk-based research concluded that the testing would be focusing on the following two regions in France:

- **Grand Est**: It was found that the Grand Est region is leading the development of the bioeconomy sector. In 2018, Grand Est designated an elected representative for bioeconomy, developed a regional bioeconomy strategy and organised significant events shaping the future of the bioeconomy in their area right after the French bioeconomy strategy was launched (Conseil Général de l'Alimentation, de l'Agriculture et des Espaces Ruraux, 2019). Also, the Grand Est region created a dedicated portal for the bioeconomy sector which hosts a database of businesses used to identify the stakeholders to be contacted for the data collection[10].
- **Normandie**: The region of Normandie comes first in France in terms of UUA as 70% of its territory is dedicated to agriculture (Chambre d'Agriculture Normandie, 2024). As it was found that focusing the analysis on the agriculture sector would be too broad of a task compared to the time allocated for the testing of this indicator, it was decided to focus on the hemp sub-sector. Indeed, hemp is a great example of circularity as all its components are valued and it is used in various sectors (construction, food, feed, paper mill, textile, essential oil, CBD). Also, France is the leading producing country of hemp in the EU (60% of production) and various projects and programmes were launched in Normandie to value the hemp sub-sector including its by-products (Chambre d'Agriculture Normandie, 2024).

[10] Bioéconomie Grand Est, Carte des acteurs de la bioéconomie. <https://www.bioeconomie-grandest.fr/>. Accessed January and February 2024.

Figure 6 below shows a regional map of France.

Figure 6. Regional map of France



4.1.2 Data collection method

Initial desk-based research was conducted in order to identify relevant data. This showed that the data needed to build this indicator at regional and company level was not available, so it was decided to conduct a stakeholder engagement exercise to fill the gap.

Stakeholder engagement exercise

Relevant organisations were identified through desk-based research for the region of Normandie and using the Grand Est's dedicated bioeconomy database. The list of the over 40 organisations contacted was recorded using MS Excel and can be found in Appendix 6.7. The following information was gathered:

- Type of organisation (public organisation, trade body or business).
- Name of the organisation.
- Name of a contact within the organisation if available.
- Email address or link to contact form.
- List of data required.
- Whether if the stakeholder was contacted and when.
- Whether if the stakeholder was chased and when.
- Whether if the stakeholder answered and when.
- Whether if the answer was useful for this indicator or not.

These organisations were contacted in French either directly via email where available using MS Outlook or through the contact form found on their website. An example of the emails sent can be found in Appendix 6.8.

Table 15 below shows the list of activities defined based on experts' opinion along with a conversion matrix to translate the type of activity in time (hours).

Table 15. Activity / time conversion matrix

Activity	Time
In person 1-2-1 meeting	1 h
In person small group meeting	2 h
Site visit	2 h
Virtual 1-2-1 meeting	0.75 h
Virtual small group meeting	1.5 h
Attending an existing webinar / conference	1 to 8 h
Participating in a webinar / conference	1 to 8 h
Organising a webinar / conference	8 to 40 h
Writing and disseminating a newsletter / briefing document	8 h
Targeted emailing and chasing	0.25 h
Targeted phone calling and calling back	0.25 h
Technical research and knowledge sharing	8 h
In person training session / workshop	1 to 8 h
Virtual training session / workshop	1 to 3 h

A data collection template created using MS Excel and written in French was sent to the organisations identified when the relevant contact was found. It presented the project and requested information on how many times an activity was conducted per year for the past 10 years. It also asked the stakeholders to provide feedback on the conversion matrix. This document can be found in Appendix 6.4.

This stakeholder engagement exercise took place from the end of January 2024 until the end of February 2024 and organisations who did not answer the initial email were sent a reminder at least once by email where feasible.

4.1.3 Calculations

The following calculation was performed on the data collected to obtain the level of engagement in hours at regional and company level:

$$Number\ of\ times\ an\ activity\ was\ undertaken_{Year\ N}\ x\ activity\ conversion\ factor = Total\ amount\ of\ hours\ spent\ per\ activity_{Year\ N}$$

With:

- The number of times an activity was undertaken was sourced from the stakeholder engagement exercise.
- The activity conversion factor was sourced from the conversion matrix mentioned in Section 4.1.2.

4.1.4 Timeline

Table 16 below shows the Gantt chart highlighting the testing timeline.

Table 16. Gantt chart

w/c	08/01	15/01	22/01	29/01	05/02	12/02	19/02	26/02	04/03	11/03	18/03	25/03	01/04
Define system boundary													
Develop activity list													
Create conversion matrix													
Design data collection template													
Identify stakeholders													
Engage with stakeholders													
Feedback analysis													
Case study writing													
Review period										Phase 1		Phase 2 & 3	
Key deliverables									Case study		Case study		Case study

4.1.5 Data gaps and mitigation

Table 17 below summarises the identified data gaps, and outlines the strategy used to mitigate the gaps where possible.

Table 17. Overview of identified data gaps, limitations and mitigation efforts

	Description of data gap	Mitigation efforts	Level of confidence
1	Data at regional and company level was not available.	• A stakeholder engagement exercise was conducted to collect data. 40+ organisations were contacted.	High
2	The stakeholders contacted either did not answer, or they could not provide the information needed.	• Stakeholders contacted were send a reminder at least once where feasible. • No other solution could be found; therefore the indicator could not be calculated.	Low

4.1.6 Quality review of analysis

To ensure robust and high-quality results, the following data validation and quality control procedures were followed:

- Prior to work beginning, the Project Director reviewed the proposed research methodology and ensured that the data collection plan was fit for purpose. Once the research team had addressed any comments from the review process, they proceeded to the data collection phase.
- The Project Manager reviewed the work done.
- The Quality Assurance Manager held responsibility for the quality of the final case study output. The Project Manager assisted the Quality Assurance Manager in judging the quality of the output and suggesting ways to improve.

4.2 KEY ANALYSIS RESULTS

4.2.1 Performance

Table 18 below describes how this indicator performs against the RACER evaluation following testing and compares this performance against its original RACER assessment. Details on the scoring are available in Appendix 6.1. The original RACER assessment for this indicator gave it a total score of 11 out of 15. Following testing, the total score remained unchanged at 11 out of 15, however, the rating per criterion has been adjusted:

- **Relevance**: The testing of this indicator left this criterion unchanged at 3 as even though no feedback was received from the 40+ stakeholders engaged with, it is still believed that this indicator provides a better understanding of circularity as networking and developing local partnerships are key to it.
- **Acceptability**: The absence of answer from the 40+ stakeholders engaged with across regions and type of stakeholders shows that this indicator is not accepted yet by stakeholders therefore the rating of this criterion was changed from 3 to 1.
- **Credibility**: The rating of this criterion was changed from 2 to 3 after the testing phase as a transparent, trustworthy and easy to interpret definition and methodology have been developed for this indicator.
- **Ease**: Even though data is not readily available, a clear and simple data collection template was developed for this indicator making the collection of the information needed to calculate it easy and the cost of collection moderate to low. Therefore, the rating of this criterion was changed from 1 to 2.
- **Robustness**: This criterion was left unchanged at 2 as even though a consistent methodology was developed and the indicator is easy to calculate, data collected might be biased as it is based on self-assessment.

Table 18. RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	3	3	2	1	2	11
After Task 5 (following testing)	3	1	3	2	2	11

4.3 CHALLENGES AND LESSONS LEARNED

4.3.1 Challenges

Stakeholder engagement

The main challenge faced during the monitoring process was the lack of engagement from the over 40 stakeholders engaged with to obtain regional and company level data on the level of engagement needed to develop the bioeconomy. No mitigation solution could be found to address this issue and therefore this indicator could not be calculated.

Additionally, the level of engagement in developing the bioeconomy is expected to vary significantly across different geographic regions and industry sectors. Indeed, local economic conditions, regulations and resource availability are expected to influence the extent and nature of engagement activities. Therefore, determining and benchmarking what constitutes a good level of engagement for the indicator may be challenging. A flexible approach for benchmarking acknowledging the regional and sectoral differences could help mitigate this challenge.

Finally, it was found that the stakeholder landscape in the bioeconomy sector is pretty complex, with a range of diverse stakeholders with varying interests, priorities and levels of engagement. Navigating this and ensuring inclusivity in engagement efforts will be very challenging and may require tailored approaches for different stakeholder groups.

Data quality

Even if data is collected, there could be concerns about its quality, accuracy and reliability, arising from inconsistencies in reporting, subjective interpretations of engagement activities or even biases in self-assessment. A robust data validation and verification processes would need to be implemented to mitigate these concerns.

Data privacy

There might be some concerns around data privacy and confidentiality, and that could be one of the reasons for the poor engagement. Some organisations are likely to be hesitant to share information or may require assurances regarding how their data will be used and protected. Clear protocols and policies for handling data would need to be developed to help address these concerns.

4.3.2 Lessons learned

Given the anticipated challenges in data availability and stakeholder engagement, it was found that the development of a long-term data collection strategy was important. This could involve establishing ongoing relationships with stakeholders and implementing regular data collection cycles. To support this data collection, legislative development, facilitation, economic or commercial incentivisation, technical guidance, support on data collection and reporting (e.g. providing a dedicated portal), or similar measures would be needed.

It is unknown if a longer period to collect data or if another method to reach out to stakeholders (e.g. phone calls) would have improved the results of the stakeholder engagement exercise but it could be worth trying.

4.4 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is considered for further development, with significant work required to facilitate its progress.

Even though the testing of this indicator identified that significant work is required so that data will be available eventually, we still recommend it for further development as we believe that the value of identifying which activity has the most used routes of engagement can be useful in prioritising funding to increase potential impact.

It is expected that this indicator is suitable for further development across the EU as its methodology should be consistent across EU member states since it is easily replicable. Furthermore, calculations are simple as data can be used directly, and results are easy to interpret. It might lack some objectiveness as it is based on self-assessment, but once data is aggregated at regional, national or EU level, its reliability will improve.

The testing of this indicator revealed challenges such as unavailability of data and unresponsiveness from stakeholders to data collection requests. It is therefore recommended that either legislative development, facilitation, economic or commercial incentivisation, technical guidance, support on data collection and reporting, or other similar measures are set up to support companies in collating data.

It is not expected that data requirements will evolve in the future as it is not expected that the methodology behind this indicator will evolve over time. This is because the data needed to measure the indicator (number of times an activity is undertaken per year), and the types of activities undertaken are expected to be consistent over time. The conversion matrix might evolve slightly at the beginning of the data collection as feedback is received from stakeholders, but this is not expected to have a significant impact on the methodology.

Regulators should aim to support networking and partnership creation so that the level of engagement needed by companies to develop a bioeconomy reduces, but it is not expected that a target can be set as a minimum of time spent will always be needed. Also, it is expected that this minimum will differ between regions, sectors or countries.

It is expected that communicating to organisations around the CE, the bioeconomy and the benefits of measuring this indicator would address the key challenge identified during the testing phase of this indicator (lack of engagement from stakeholders).

Following the testing of this indicator, it was found that its original name ‘Level of engagement by companies in developing a bioeconomy, categorised by the types of activities undertaken’ was fit for purpose and that no variation was needed.

Measuring this indicator would be complementary to the EU monitoring framework as it would add a new facet to it around the need for networking and partnership development to facilitate and improve the development of a CE in the bioeconomy sector (and potentially in other sectors if rolled out).

Table 19: Summary of recommendations for indicator B5

Type of recommendation	Recommendation	RACER criteria addressed	Timeline	Key stakeholders or partners
Economic or commercial incentivisation	Development of incentive mechanisms to encourage greater participation and data sharing from stakeholders. This could include recognition programmes or access to funding opportunities.	Acceptability	Medium (1.5 – 5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies
Technical guidance, support on data collection and reporting	Investing in capacity-building initiatives aimed at enhancing stakeholder knowledge and skills related to bioeconomy development and data collection methodologies. This could involve training workshops, webinars or sector-specific guidance tailored to different stakeholder groups.	Ease and Robustness	Medium (1.5 – 5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies
Communication	Improve companies' engagement in measuring this indicator.	Acceptability	Short (0.5 – 1.5 years)	Responsible: Member States Accountable: regional public organisations Consulted: relevant trade bodies Informed: relevant companies

5. INDICATOR 4 - COST SAVINGS THROUGH INDUSTRIAL SYMBIOSES USING BIO-BASED MATERIAL

The aim of this indicator is to measure the cost savings that are made through industrial symbioses that replace raw materials with bio-based material alternatives. The indicator requires two inputs: 1) a list of all relevant industrial symbioses and 2) cost savings from using bio-based material for each symbiosis.

Cost savings was chosen as key metric for this indicator as it is believed to have an over-arching impact on other topics such as resource efficiency and waste reduction. Indeed, the savings made by replacing raw material with feedstock are perceived as an incentive to use feedstock instead of raw material and therefore improve resource efficiency and reduce waste.

Industrial symbiosis, in the context of the CE, is the practice where different industries and organisations collaborate by exchanging resources, such as materials, energy, or by-products. Bio-based material alternatives in the context of industrial symbiosis are key to developing a CE. By fostering collaboration between industries, industrial symbioses enable the transformation of waste streams from one industry into usable inputs for another. This directly translates to a reduction in raw material consumption and can support the minimisation of waste generation across industries. This is particularly true of bio-based materials which can be key to the design of a CE.

There are many benefits to monitoring this indicator, for example:

- Enabling industries to leverage data to optimise resource use.
- Allowing policymakers to pinpoint areas for development or further savings.

5.1 KEY METHODOLOGY

5.1.1 Testing method

To investigate bioeconomy related industrial symbioses at regional level, the study initially focussed on two regions recognised for advancements in sustainability and the CE, particularly within the bioeconomy sector. Given their well-documented efforts in these areas, the Zealand Region of Denmark and the Grand Est Region of France were chosen as the primary system boundaries.

Desk-based research was conducted on these two areas:

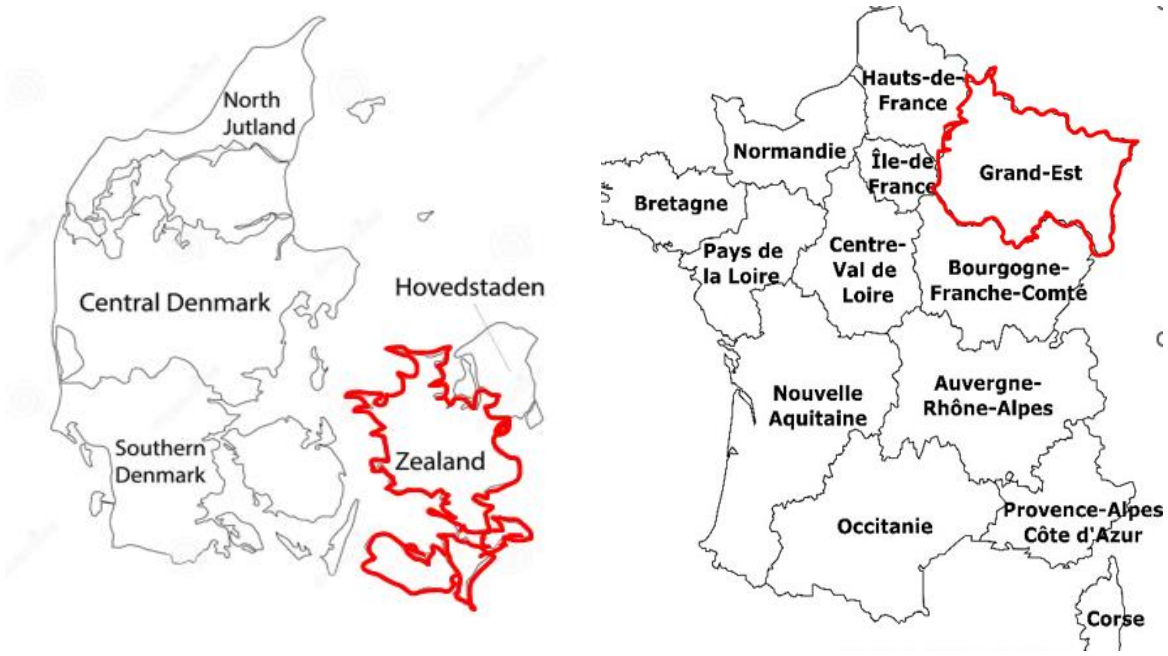
Zealand, Denmark: The Zealand Region is a frontrunner in biorefineries, with facilities like Kalundborg Symbiosis and the world's largest enzyme producer, Novozymes, located there. These facilities exemplify how the region utilises biomass for the production of valuable bio-based products, creating several opportunities for industrial symbiosis through waste heat or biomass residual streams.[11]

Grand Est, France: The Grand Est region is leading the development of the bioeconomy sector in France. Indeed, in 2018, Grand Est designated an elected representative, developed a regional bioeconomy strategy and organised significant events shaping the future of the bioeconomy in their area immediately after the French bioeconomy strategy was launched (Conseil Général de l'Alimentation, de l'Agriculture et des Espaces Ruraux, 2019). Also, the Grand Est region created a dedicated portal for the bioeconomy sector which hosts a database of businesses used to identify the stakeholders to be contacted for the data collection as previously referenced.

[11] J. Teräs, I.H.G. Johnsen, G. Lindberg, L. Perjo, Bioeconomy in the Nordic region: Regional case studies < https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A843815&dswid=-2428> [accessed February 2024]

Figure 7 highlights the initially chosen regions for research:

Figure 7: Zealand Region in Denmark and Grand-Est in France



Due to low participation in the initial regional testing in Denmark and France, the data collection strategy at company level shifted to focus on individual organisations regardless of their location, researching organisations across several European geographies. This approach aimed to capture a broader range of bio-based industrial symbiosis examples and improve response rates.

5.1.2 Data collection method

A preliminary review of existing data sources was conducted to identify relevant metrics for developing the indicator via desk-based research. The initial assessment revealed a lack of data at both the regional and company levels necessary for fully populating the indicator. Consequently, a stakeholder engagement exercise was determined to be the most appropriate approach for gathering the required information.

Returning to the regional focus on the Zealand and Grand Est Regions, relevant organisations were identified and a MS Excel spreadsheet was developed for the purpose of recording information about the relevant 30+ organisations which were contacted. The contact spreadsheet can be found in Appendix 6.9. The following information was gathered:

- Stakeholder type (e.g. governmental, research facility, chemical, etc).
- Name of the organisation.
- Name and email address of a contact within the organisation if available, link to the organisation's website if not.
- Comments on the organisation.
- List of data required.
- Whether if the stakeholder was contacted and when.
- Whether if the stakeholder answered.
- Whether if the stakeholder was chased and when.
- When data was received.
- Issues that arose from the engagement process and whether if they were answered.

Organisations were contacted directly via email where contact details were available. Where these details were not retrievable, the website contact form or LinkedIn was used. An example email can be found in Appendix 6.10.

The stakeholder engagement exercise was conducted from the end of January 2024 through to the beginning of March 2024. Where feasible, organisations that did not respond to the initial email were followed up with at least one additional email.

5.1.3 Calculations

Initially, the development of this indicator assumed stakeholder-provided data on cost savings would be the direct output, without the need for further calculations. However, the desk-based research yielded insufficient data to construct the indicator at the regional and company levels. Efforts to gather information through stakeholder engagement were also unsuccessful, either due to a lack of response or the inability of contacted organisations to share relevant data.

Two interviews took place where the inability to share relevant data was explained. In the first interview with Kalundborg Symbiosis[12], it was explained that stringent data sharing authorisation protocols and a suspected lack of specific data relating to cost savings meant that no data could be shared. The second interview with GRID Granollers[13] revealed that changes in waste regulations in Spain would have made it difficult to report data on the indicator as well as the fact that the industrial estates within the area covered by GRID Granollers were comprised of SMEs without the knowledge and resources to provide the necessary data being requested.

Despite limitations, both interviewees acknowledged the value of reporting on the indicator citing that using biobased materials instead of fossil-based materials would have positive environmental and commercial benefits. It was also mentioned that being able to quantify the savings from industrial symbioses through the use of biobased materials would provide useful insight into the effectiveness of local policies and support the development of future industrial symbioses networks, and by extension, improve the chances of accessing funding and subsidies from government.

Ultimately, the low response rate and limitations in data sharing among those who did respond meant that no calculations were made for this indicator.

5.1.4 Timeline

Table 20 presents the Gantt chart outlining the testing timeline for the indicator.

Table 20: Gantt Chart for Indicator Timeline

w/c	08/01	15/01	22/01	29/01	05/02	12/02	19/02	26/02	04/03	11/03	18/03	25/03	01/04
Define system boundary													
Desk based research to identify Industrial Symbioses													
Data request to industry associations to identify Industrial Symbioses													
Follow-up emails													

[12] Kalundborg Symbiosis <https://www.symbiosis.dk/en/> [Accessed February 2024]
[13] GRID Granollers <https://www.gridgranollers.com/> [Accessed February 2024]

w/c	08/01	15/01	22/01	29/01	05/02	12/02	19/02	26/02	04/03	11/03	18/03	25/03	01/04
Conduct Analysis													
Case study writing													
Review period										Phase 1		Phase 2 & 3	
Key deliverables											Case study		Case study

5.1.5 Data gaps and mitigation

Table 21 provides an explanation for the data gaps and highlights efforts to mitigate them.

Table 21. Overview of identified data gaps, limitations and mitigation efforts

	Description of data gap	Mitigation efforts	Level of confidence
1	There was a shortage of data available at regional and company level.	A stakeholder engagement exercise was conducted to collect data. 30+ organisations were contacted.	High
2	The stakeholders contacted either did not answer, or they could not provide the information needed.	Stakeholders contacted were sent follow-up emails and messages at least once where feasible. No other solution could be found; therefore the indicator could not be calculated.	Low

5.1.6 Quality review of analysis

To ensure robust and high-quality results, the following data validation and quality control procedures were followed:

- Prior to work beginning, the Project Director reviewed the proposed research methodology and ensured that the data collection plan was fit for purpose. Once the research team had addressed any comments from the review process, they proceeded to the data collection phase.
- The Project Manager or a delegate reviewed the work done.
- The Quality Assurance Manager held responsibility for the quality of the final case study output. The Project Manager assisted the Quality Assurance Manager in judging the quality of the output and suggesting ways to improve.

5.2 KEY RESULTS

5.2.1 Performance

Table 22 illustrates the performance of the indicator in the research against the original RACER assessment. Details on the scoring are available in Appendix 6.1. The original assessment determined the indicator to have a score of 14 out of 15. However, this score changed to 11 out of 15 following the research, with the criteria for ease and robustness changing from a score of 3 to 1 and 3 to 2 respectively. The rationale for these changes in score is outlined below:

- Relevance: The indicator's relevance has maintained a score of 3 despite the limited data received from contacted stakeholders. The two interviews that took place confirmed its importance, and it is still considered to add value to the EU CE Framework.

- Acceptability: The general lack of response as well as some further questioning around the indicator's definition indicated that there were some challenges with its acceptability. However, the acknowledged value of the indicator meant that the rating of 2 remained unchanged.
- Credibility: Despite challenges in data collection, the indicator retains its credibility score of 3 The concept of industrial symbiosis is well-established, and interviews with Kalundborg Symbiosis and GRID Granollers acknowledged its value. Furthermore, the indicator's potential for refinement through future data collection efforts is recognised.
- Ease: Data collection efforts, including a comprehensive data collection plan and outreach to over 30 stakeholders, were insufficient to definitively assess this indicator. Therefore, the score has been revised from 3 to 1.
- Robustness: Following some ambiguity regarding the definition of "bio-based materials" and indications from responding contacts concerning challenges in establishing cost-saving boundaries due to external factors impacting true cost savings, the indicator's robustness score has been adjusted from 3 to 2.

Table 22. RACER evaluation

Stage of project	RACER criterion					Score
	Relevance	Acceptability	Credibility	Ease	Robustness	
Task 4 (original RACER assessment)	3	2	3	3	3	14
After Task 5 (following testing)	3	2	3	1	2	11

5.3 CHALLENGES AND LESSONS LEARNED

5.3.1 Challenges

The most pressing challenge relating to this indicator was the inability to obtain the necessary data. Despite over 30 stakeholders being contacted at least two times, data collection proved unsuccessful. This was due to one of two factors:

- **Limited data availability:** In some instances, contacted organisations revealed in the interviews that they were unable to provide the relevant data citing several reasons including:
  - Gaps within their, or other organisations within their industrial symbiosis networks, operations.
  - Preventative regulations.
  - Lack of capacity to gather data.
  - Unavailability of data.
  - Slow data access due to strict authorisation procedures.
- **Low response rate:** The majority of the contacts did not respond to outreach efforts which limited the success of the process.

5.3.2 Lessons Learned

The low response rate and limitations cited by those who did respond highlighted the need for improved outreach strategies in future assessments. Exploring alternative data collection methods beyond initial correspondence and interviews, such as utilising surveys or providing improved technical guidance, could be beneficial.

Additionally, engaging contacts at an earlier stage to understand potential data access hurdles could streamline the process. The research process for this indicator underlines the importance of communicating

the value of data sharing in a way that is meaningful and engaging, to improve the chances of successful research efforts in future.

Furthermore, considering incentives for those who can share data, whether monetary or through recognition, could be explored to encourage an improved level of engagement.

5.4 CONCLUSIONS AND RECOMMENDATIONS

It is recommended that this indicator is considered for further development, with significant work required to facilitate its progress.

Even though the testing of this indicator identified significant challenges, it was found that the indicator “Cost savings made through industrial symbioses using bio-based materials” still holds promise for being developed further as an indicator for tracking progress towards a CE in the EU. Indeed, quantifying the savings generated through using bio-based materials can provide useful insight into the effectiveness of regional and organisational policies for supporting the development of industrial symbiosis networks, which by extension provides credibility for receiving funding and subsidies from governments to promote such activities.

It was found that quantifying the cost savings directly attributable to using bio-based materials within industrial symbioses presents a challenge. A well-defined methodology for calculating cost savings is crucial, and achieving an accurate picture requires acknowledging the complexity of the various interlinked influencing factors. These factors include fluctuating market prices, evolving production efficiencies, and dynamic waste management practices. All of these can significantly impact the actual cost savings generated. The development of this methodology, in a form that will be accepted and used appropriately by the relevant industrial parties, is not possible with the type of engagement which has been attempted in this project. An understanding of stakeholders’ challenges around data collection and reporting, and which legislative or support mechanisms could help overcome those challenges, is a vital foundation stone to building an effective calculation methodology.

Therefore, it is recommended to develop a comprehensive methodology that goes beyond simply calculating the difference in costs between traditional and bio-based materials. This methodology should isolate the specific cost savings resulting from the use of bio-based materials within industrial symbiosis partnerships. While achieving complete isolation might not be possible, a robust methodology can provide a more accurate picture of the true cost-saving potential of this approach.

The initial research encountered difficulties in acquiring data from stakeholders, perhaps highlighting the need for a comprehensive approach that considers alternative data collection methods. It is recommended that improved technical guidance is developed, and financial and/or recognition-based incentives are considered to support better data collation. Examples of such incentives could include grants, subsidies, or showcasing participating organisations in high-profile case studies to increase their visibility.

Of the contacts who did respond to outreach, on more than one occasion, questions were raised about what exactly “bio-based materials” were. This could encompass a diverse range of materials. Defining clear boundaries for what constitutes a bio-based material and standardising data collection formats across different industrial sectors could benefit future research, by ensuring that the indicator captures comparable data across the EU.

The initial research underlined several limitations on data sharing with respondents citing internal protocols, regulations, and lack of capacity. Developing clear guidelines and communication strategies that address and support the concerns of contacts, while outlining the benefits of data sharing could foster a greater standard of engagement. Additionally, as previously highlighted, offering incentives could motivate contacts to make data contributions.

By addressing these challenges and investing in robust data collection methods, the indicator "cost savings made through industrial symbiosis using bio-based alternatives" can be a valuable tool for tracking progress towards a more sustainable and circular EU.

Following the testing of this indicator, it was found that its original name ‘Cost savings through industrial symbioses using bio-based material’ was fit for purpose and that no variation was needed.

Finally, consideration of this indicator in the EU monitoring framework would complement the current metrics of waste management, production and consumption, secondary materials, and competitiveness and innovation, thereby offering further granularity to the framework for monitoring the CE at EU level.

Table 23: Summary of recommendations for indicator B6

Type of recommendation	Recommendation	RACER criteria addressed	Timeline	Key stakeholders or partners
Economic or commercial incentivisation	Development of incentive mechanisms to encourage greater participation and data sharing from stakeholders. This could include recognition programmes or access to funding opportunities.	Acceptability	Short (0.5 – 1.5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies
Technical guidance, support on data collection and reporting	Investing in capacity-building initiatives aimed at enhancing stakeholder knowledge and skills related to bioeconomy development and data collection methodologies. This could involve training workshops, webinars or sector-specific guidance tailored to different stakeholder groups.	Ease and Robustness	Short (0.5 – 1.5 years)	Responsible: EC Accountable: Member States Consulted: relevant trade bodies Informed: relevant companies
Communication	Develop comprehensive communication materials outlining the indicator measurement requirements to improve company engagement.	Acceptability	Short term (0.5 – 1.5 years)	Responsible: EU state members Accountable: regional public organisations Consulted: relevant trade bodies Informed: relevant companies
Research and Development	Develop and disseminate clear, comprehensive definitions of “bio-based materials” as well as standardised protocols for data collection and reporting across sectors.	Ease and Robustness	Short term (1.5 – 5 years)	Responsible: EC Accountable: EU state members Consulted: relevant trade bodies and local governments Informed: relevant companies

6. APPENDICES

RACER MATRIX

Criterion	Description	1 (Poor)	2 (Neutral)	3 (Good)
Relevance	Refers to whether the indicator is closely linked to the objectives to be reached.	Does not support a better understanding of true circularity.	Supports a better understanding of true circularity.	Highly supportive towards gaining a better understanding of true circularity.
		Supports no value-added circular opportunities.	Supports lower value-added opportunities (i.e. metrics related to waste generation, recycling, waste management, etc.)	Supports higher value-added opportunities (i.e. all R-strategies above remanufacturing) and wider systemic change (e.g. indicators that encourage PSS or circular design).
		Not linked to the project objectives and/or European policy objectives (existing or upcoming).	Linked to the project objectives, but not to European policy objectives (existing and/or upcoming).	Fully aligned with project objectives and European policy objectives (existing and/or upcoming).
Acceptance	Refers to whether the indicator is perceived and used by key stakeholders (such as policymakers, civil society, and industry).	Poorly accepted by key stakeholders, e.g. due to the use of confidential data.	Relatively accepted by key stakeholders as the benefits of measuring are clear.	Key stakeholders are motived to report this indicator, due to mandatory legislative requirements (current or upcoming), potential commercial benefit or being in the public interest.
Credibility	Refers to whether the indicator is transparent, trustworthy and easy to interpret.	No defined methodology associated with this indicator and/or interpretation of the indicator is ambiguous.	Methodologies have been proposed or currently existing, but not for this particular indicator (e.g. in a research article).	There is an EU defined methodology.
		Difficult to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are not familiar with).	Moderately easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are aware of but are not confident in practical use).	Easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders already use and are confident in applying).
Ease	Refers to the easiness of measuring and monitoring the indicator.	No defined methodology associated with this indicator and/or interpretation of the indicator is ambiguous.	Methodologies have been proposed or currently existing, but not for this particular indicator (e.g. in a research article).	There is an EU defined methodology.
		Difficult to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are not familiar with).	Moderately easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are aware of but are not confident in practical use).	Easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders already use and are confident in applying).
Robustness	Refers to whether data is biased and comprehensively assesses circularity.	No consistent methodology and dataset are available.	A consistent methodology and dataset available.	A consistent methodology and dataset available.
			A composite/aggregated indicator (based on multiples dimensions).	A one-dimensional indicator.
			A proxy indicator.	

6.2 INDICATOR 1 – DATA

See MS Excel document “DGRTD_B1_Data_V01.00 “ provided alongside this report.

6.3 INDICATOR 1 – LIST OF STAKEHOLDERS ENGAGED

See MS Excel document “DGRTD_B1_StakeholderEngagementTracker_V01.00 “ provided alongside this report.

6.4 INDICATOR 1 – EXAMPLE OF EMAIL SENT TO STAKEHOLDERS

From: Bonfait, Julie <Julie.Bonfait@ricardo.com>
Sent: Thursday, February 8, 2024 13:24
To: ioc@iocwine.com <ioc@iocwine.com>
Subject: Demande d'informations : étude de la Commission Européenne sur les indicateurs de l'économie circulaire

Bonjour,

Mon nom est Julie Bonfait, je suis consultante senior au sein de l'équipe Economie Circulaire chez Ricardo plc, une entreprise britannique de conseil en environnement.

Notre équipe dirige actuellement un partenariat pour développer et tester des indicateurs adaptés à la mesure de la circularité pour la Direction de la recherche et de l'innovation (DG-RTD) de la Commission Européenne.
En raison de mes recherches axées sur le domaine de la bioéconomie, j'aimerais savoir si votre organisation serait intéressée à participer à une étude de cas.

Pour ce faire, je souhaiterais collecter des données sur les indicateurs suivants :
- Niveau d'engagement nécessaire aux entreprises pour développer une bioéconomie qui soutient la biosphère qui les entoure.
- Investissements privés, création d'emplois et valeur ajoutée brute liés au développement de la bioéconomie.

Seriez-vous intéressé à en discuter davantage ? Ou bien, êtes-vous en mesure de recommander un contact qui le serait ?

Quels seront les avantages pour votre organisation?

Les données et les informations que vous fournissez seront analysées pour comprendre dans quelle mesure ces indicateurs sont réalisables et pratiques pour mesurer la circularité dans l'ensemble de l'UE.

En participant vous pourrez :
- Vous exprimez sur la manière dont la circularité sera mesurée dans l'UE, dans chaque État membre, dans votre secteur et région.
- Nous aider à recommander un ensemble solide d'indicateurs qui permettront à votre organisation de veiller et d'améliorer sa circularité.
- Présenter l'engagement de votre organisation dans la recherche de pointe en économie circulaire qui sera présentée aux décideurs politiques de l'UE.

Veuillez trouver ci-joint une lettre de soutien de la DG-RTD qui contient des informations générales supplémentaires sur le projet.

N'hésitez pas a me faire savoir si vous avez des questions.

Je vous remercie de votre temps et de votre aide,
Bien cordialement,
Julie

Julie Bonfait, AssocMCIWM
Senior Consultant in Circular Economy
Working days:

- Mon, Wed, Thu & Fri: 8 am - 4 pm
- Tue: not working

Email: julie.bonfait@ricardo.com
Direct Dial: +44 (0)1235 753 233

6.5 INDICATOR 1 – DATA COLLECTION TEMPLATE

See MS Excel document “DGRTD_B1_DataCollection_V01.00“ provided alongside this report.

6.6 INDICATOR 2 – DATA

See MS Excel document “DGRTD_B4_Data_V01.00“ provided alongside this report.

6.7 INDICATOR 3 – LIST OF STAKEHOLDERS ENGAGED

See MS Excel document "DGRTD_B5_StakeholderEngagementTracker_V01.00 " provided alongside this report.

6.8 INDICATOR 3 – EXAMPLE OF EMAIL SENT TO STAKEHOLDERS

From: Bonfait, Julie <Julie.Bonfait@ricardo.com>
Sent: Tuesday, January 30, 2024 16:20
To: contact@agrochanvre.com <contact@agrochanvre.com>
Subject: Demande d'informations : étude de la Commission Européenne sur les indicateurs de l'économie circulaire

Bonjour,

Mon nom est Julie Bonfait, je suis consultante senior au sein de l'équipe Economie Circulaire chez Ricardo plc, une entreprise britannique de conseil en environnement.

Notre équipe dirige actuellement un partenariat pour développer et tester des indicateurs adaptés à la mesure de la circularité pour la Direction de la recherche et de l'innovation (DG-RTD) de la Commission Européenne.
En raison de mes recherches axées sur le domaine de la bioéconomie, j'aimerais savoir si votre organisation serait intéressée à participer à une étude de cas.
Pour ce faire, je souhaiterais collecter des données sur les indicateurs suivants :

- Niveau d'engagement nécessaire aux entreprises pour développer une bioéconomie autour du chanvre en Normandie.
- Investissements privés, création d'emplois et valeur ajoutée brute liés au secteur du chanvre en Normandie.

Seriez-vous intéressée à en discuter davantage ? Ou bien, êtes-vous en mesure de recommander un contact qui le serait ?

Quels seront les avantages de votre organisation?
Les données et les informations que vous fournissez seront analysées pour comprendre dans quelle mesure ces indicateurs sont réalisables et pratiques pour mesurer la circularité dans l'ensemble de l'UE.

En participant vous pourrez :

- Vous exprimez sur la manière dont la circularité sera mesurée dans l'UE, dans chaque État membre, dans votre secteur et région.
- Nous aider à recommander un ensemble solide d'indicateurs qui permettront à votre organisation de veiller et d'améliorer la circularité du chanvre en région Normandie.
- Présenter l'engagement de votre organisation dans la recherche de pointe en économie circulaire qui sera présentée aux décideurs politiques de l'UE.

Veuillez trouver ci-joint une lettre de soutien de la DG-RTD qui contient des informations générales supplémentaires sur le projet.
N'hésitez pas a me faire savoir si vous avez des questions.

Je vous remercie de votre temps et de votre aide,
Bien cordialement,
Julie

Julie Bonfait
Senior Consultant in Circular Economy
Working days: Mon – Thu

Email: julie.bonfait@ricardo.com
Direct Dial: +44 (0)1235 753 233

6.9 INDICATOR 3 – DATA COLLECTION TEMPLATE

See MS Excel document "DGRTD_B5_DataCollection_V01.00" provided alongside this report.

6.10 INDICATOR 4 - LIST OF STAKEHOLDERS ENGAGED

See MS Excel document "DGRTD_B6_StakeholderEngagementTracker_V01.00 "provided alongside this report.

6.11 INDICATOR 4 – EXAMPLE OF EMAIL SENT TO STAKEHOLDERS

Fra: Taylor, Max <Max.Taylor@ricardo.com>
Sendt: 6. februar 2024 15:27
Til: Per Møller <peml@kalundborg.dk>
Emne: Request for information: European Commission study on circular economy indicators

Dear Per,

My name is Max Taylor, I am a consultant working for the Circular Economy team at Ricardo plc, a UK-based environmental consulting company. Our team is currently leading a consortium of partners to develop and test indicators to measure circularity for the European Commission's Directorate for Research and Innovation (DG-RTD). Because of my research in the area of bioeconomy, I would like to know if your organisation would be interested in participating in a case study as part of the business network around industrial symbioses in the Kalundborg Eco-Industrial Park. To do this, I would like to collect data on the following indicators:

- Level of commitment necessary for companies to develop a bioeconomy that supports the biosphere around them.
- Private investment, job creation and gross value added linked to the development of the bioeconomy.
- Cost savings through industrial symbioses using bio-based materials.

Would you be interested in discussing these further? Or alternatively, are you able to recommend a contact who would be?
What will be the benefits of your organisation? The data and information you provide will be analysed to understand how feasible and practical these indicators are for measuring circularity across the EU. By participating you can:

- Express how circularity will be measured in the EU, in each Member State, in your sector and region.
- Help us recommend a solid set of indicators that will enable your organization to monitor and improve its circularity.
- Present your organisation's commitment to cutting-edge circular economy research to be presented to EU policymakers.

Please find attached a letter of support from DG-RTD which contains additional background information on the project. Please let me know if you have any questions.

Thank you for your time and help,

Best regards,

Max

Max Taylor *he/him*
Consultant
Sustainability

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