



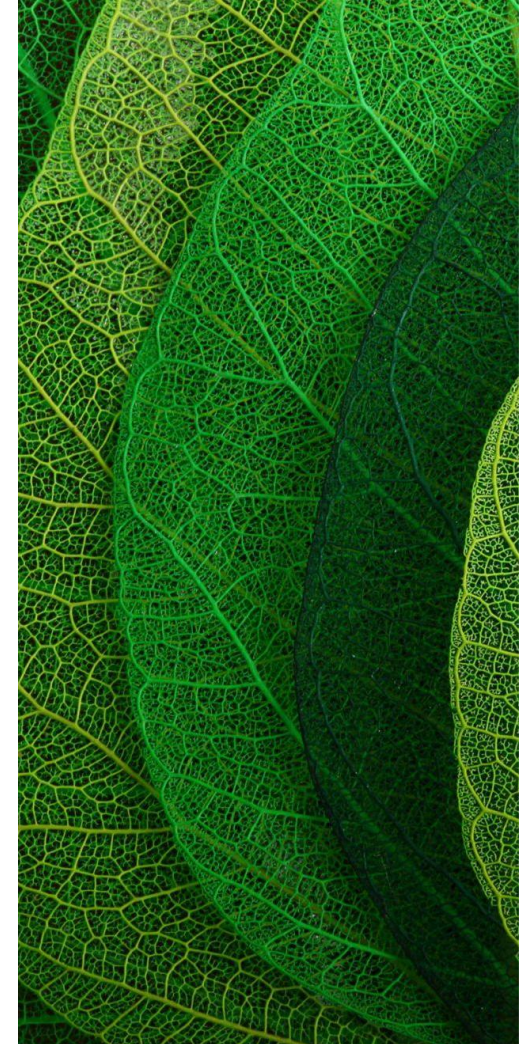
Bio-Barometer Survey: **Shaping the Future of Bio-Based and Biodegradable Solutions**

01 April 2025



Contents

- 01 Executive Summary
- 02 Introduction
- 03 Effective Innovation Systems
- 04 Barriers to Adoption
- 05 Knowledge Generation
- 06 Access to Resources
- 07 Entrepreneurial Activity
- 08 Policy and Regulatory Environment
- 09 Legitimacy of Sector
- 10 Communication and Dissemination
- 11 Future of the Bio-Based Sector
- 12 Conclusions and Way Forward



01 Executive Summary



Executive Summary

The Bio-Barometer Survey was launched to assess the current landscape, opportunities, and challenges in the bio-based and biodegradable materials (BB-Materials) sector. This initiative gathers insights from key stakeholders, including manufacturers, policymakers, researchers, and consumers, to shape the future of sustainable bio-based solutions. Key findings are detailed below:

Innovation Systems

- Strong research and development (R&D) ecosystem in the UK, particularly in university spinouts.
- However, challenges exist in translating research into commercial success due to limited domestic chemical industry support and fragmented government policies.

Barriers to Adoption

- Regulatory and policy challenges hinder the sector's growth.
- UK legislation lags behind European, USA and Asian counterparts, driving expertise and investment abroad.

Knowledge Generation & Access to Resources

- The UK excels in knowledge generation, but lacks translation to scale up, resulting in the lack of scaling-up opportunities.
- Funding gaps and difficulties in securing resources prevent startups from thriving.

Entrepreneurial Activity & Investment Climate

- Entrepreneurial activity is moderate, but risk-averse investment culture limits long-term sector viability.
- Public funding mechanisms need reform to be more accessible and efficient.

Policy & Regulatory Environment

- No positive policies or regulations for bio-based materials.
- Existing regulations are restrictive, failing to support innovation and market formation.

Legitimacy & Public Perception

- Confusion persists between bio-based materials and biodegradability.
- Public education and clear communication strategies are critical for adoption.

Future Outlook

- The bio-based sector is vital to the UK's NetZero goals, and there is an urgent need to improve funding mechanisms, reduce regulatory barriers, and foster public-private collaboration to ensure long-term success.

02 Introduction



Introduction

The global demand for sustainable solutions has never been greater, and bio-based and biodegradable chemicals and materials are at the forefront of this transformation. These innovations have the potential to revolutionise industries, reduce reliance on fossil-based resources, and significantly contribute to global sustainability goals.

To better understand the opportunities and challenges facing this critical sector, the *Bio-Barometer Survey* has been established, to gather insights from key stakeholders across the value chain, including researchers, manufacturers, and policymakers.

Outputs will help shape the future of the bio-based and biodegradable sector by identifying emerging trends, barriers to adoption, and areas for policy support and investment. We hope this report can play a vital role in steering the development and commercialisation of sustainable materials, that not only meet market demands, but also contribute to a cleaner, greener future.

The first edition of the *Bio-Barometer Survey* was launched in late January 2025, remaining open for six weeks to collect responses. The results will serve as a benchmark for industry progress, providing actionable data to guide decision-makers, foster collaboration, and drive impactful change across sectors. By leveraging these insights, we can ensure that bio-based and biodegradable solutions continue to gain traction, making a meaningful difference in the journey towards global sustainability.

Gather key insights



Identify emerging trends

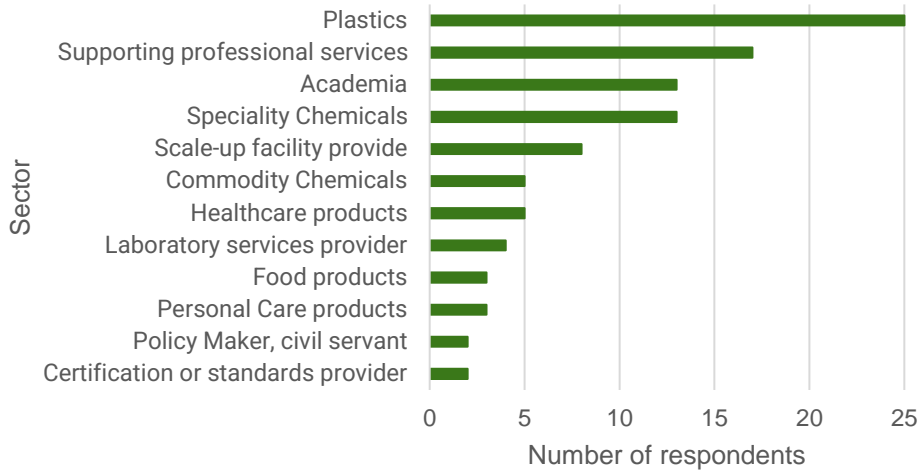


Shape future policy

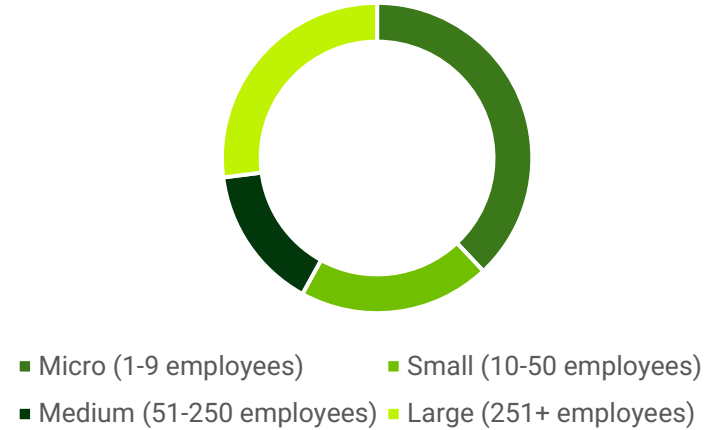


Survey response demographics

Survey respondents by sector



Survey respondents by organisation size



03 Effective Innovation Systems

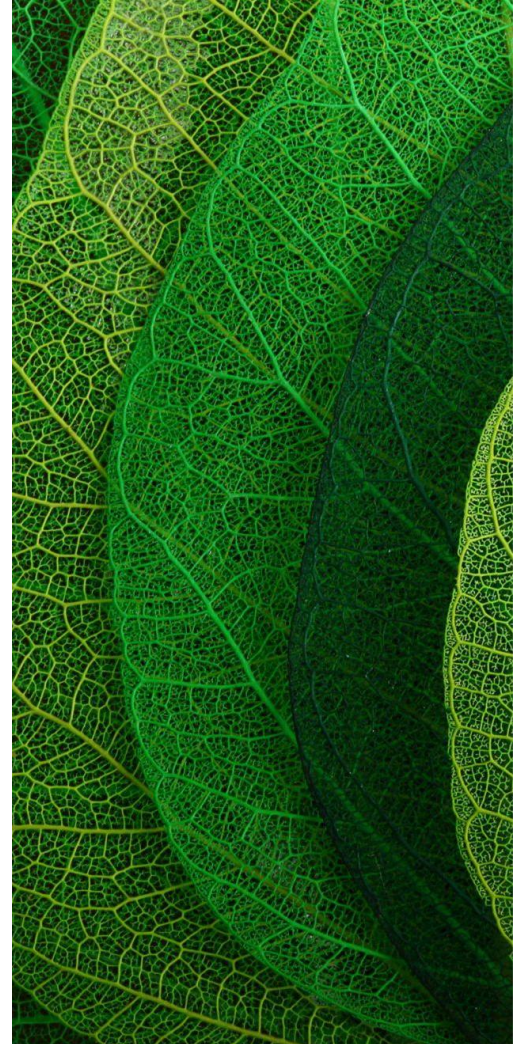


Summary

A **strong innovation system** is crucial for advancing bio-based solutions. The UK has world-class **R&D institutions**, but innovation often **fails to transition into commercial success**.

Key challenges include:

- **Limited access to funding** for scale-up.
- **Fragmented policies** creating uncertainty.
- **Lack of coordination** between government bodies.
- A more **integrated approach** with **long-term policy support** is needed.



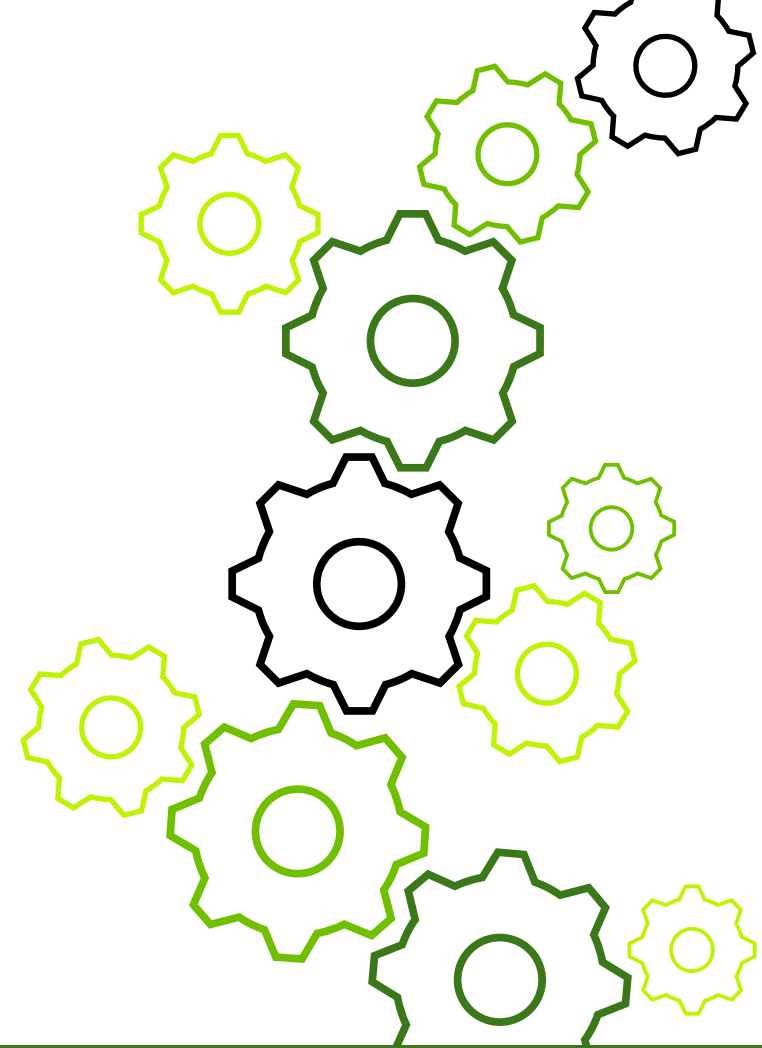
Effective Innovation Systems

Effective innovation systems rely on the seamless interaction of multiple functions that drive progress, adaptability, and sustained growth. These functions typically include knowledge generation, entrepreneurship, resource mobilization, market formation, and policy support.

A well-functioning system ensures that new ideas and technologies are continuously developed, refined, and brought to market in a way that meets societal and economic needs. By fostering collaboration between research institutions, businesses, and policymakers, innovation systems create an environment where novel solutions can emerge and thrive.

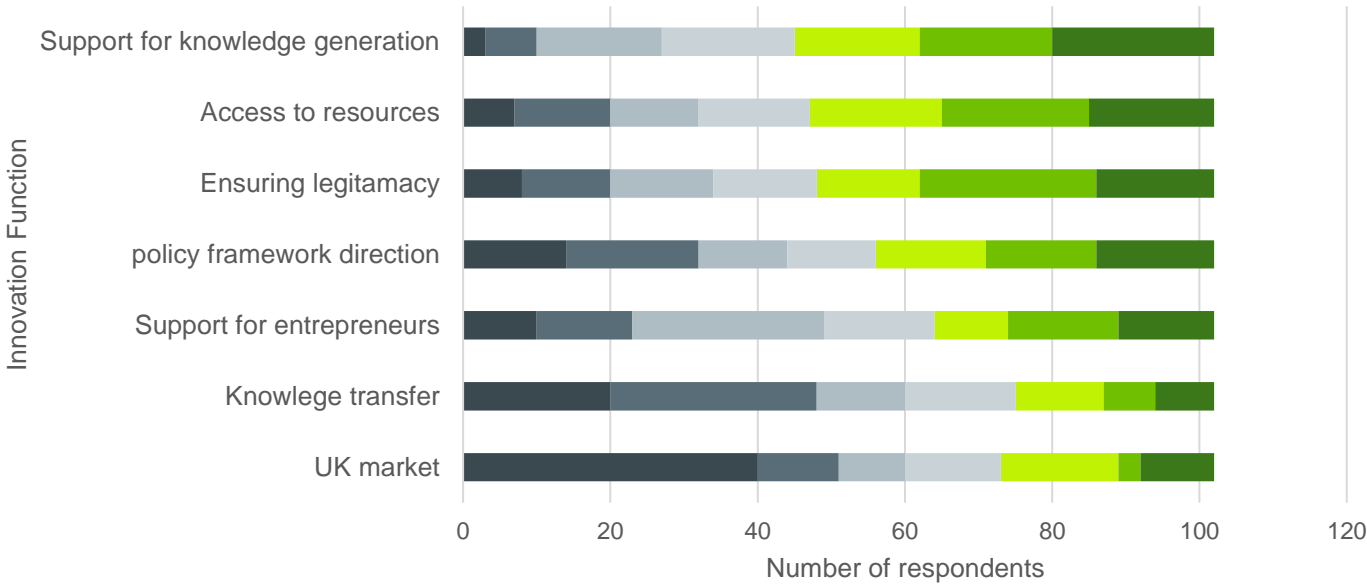
Moreover, the efficiency of these functions determines how effectively an innovation system can respond to challenges and opportunities. For instance, strong knowledge-sharing networks and R&D investments enable the rapid diffusion of new technologies, while robust financial mechanisms ensure that promising innovations receive adequate funding.

Regulatory frameworks and policy incentives also play a crucial role in shaping market demand and reducing uncertainties for innovators. When these elements work in harmony, they contribute to a dynamic and resilient innovation ecosystem that drives technological advancement, economic competitiveness, and social progress.



Effective Innovation Systems

Innovation system functions in terms of importance for UK development activities



7th choice
 6th choice
 5th choice
 4th choice
 3rd choice
 2nd choice
 1st choice



R&D will generally always be supported in academia, but we need to turn that knowledge into wealth creation, so enabling businesses to thrive through timely access to resources is very important. We need supportive policy in place, alongside with longevity, and to remove competition within government departments that disadvantages the bioeconomy.

CEO, Large Bio-based Corporate



04 Barriers to Adoption

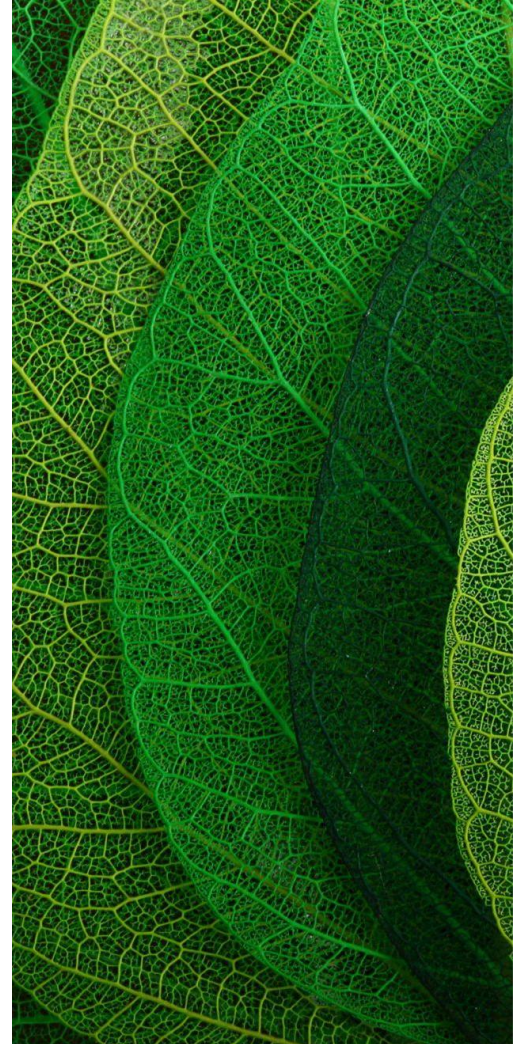


Summary

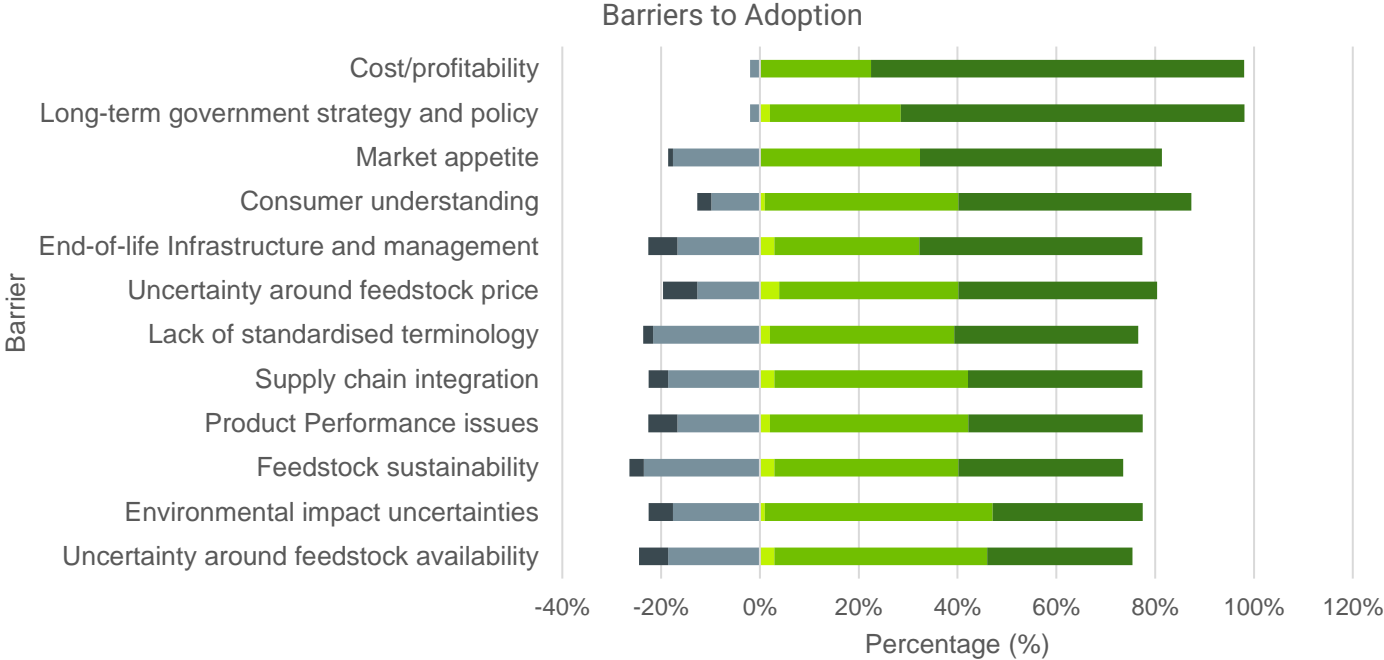
Despite expertise in the **bioeconomy**, and bio-based and biodegradable materials the UK's **restrictive legislation** drives investment to Continental Europe.

Main barriers include:

- **Regulatory uncertainty** affecting market confidence.
- **Lack of positive regulation** for bio-based material adoption.
- **Supply chain constraints** limiting industry scalability.
- Reforms are necessary to **remove market-entry barriers** and enhance **competitiveness**.



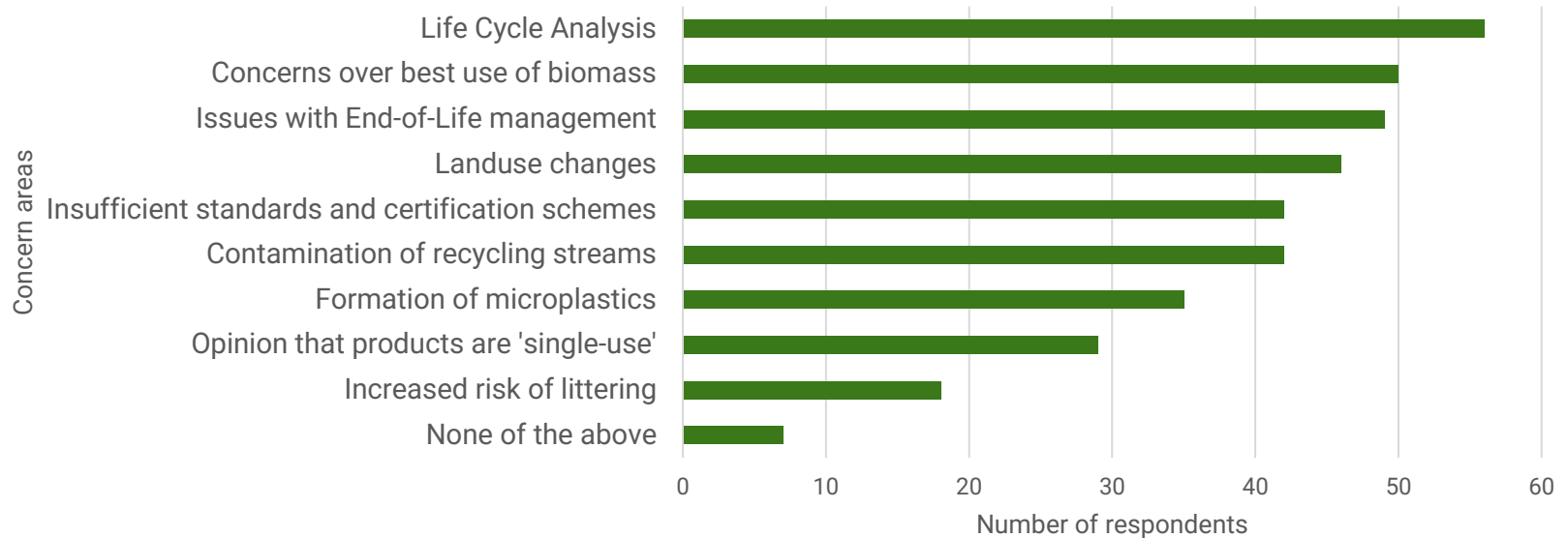
Barriers to Adoption



Not at all significant |
 Not very significant |
 Don't know |
 Somewhat significant |
 Hugely significant

Stakeholder Concerns

Stakeholder concerns over BB-Materials





Working in the bioeconomy industry in the last year, there are a lot of expertise and general knowledge. However, given the current legislation, a lot of organisations are not currently expanding in the UK, but rather elsewhere in Continental Europe, where there is a more favourable outlook for bio-based and biodegradable materials.

MD, Bio-based SME



05 Knowledge Generation

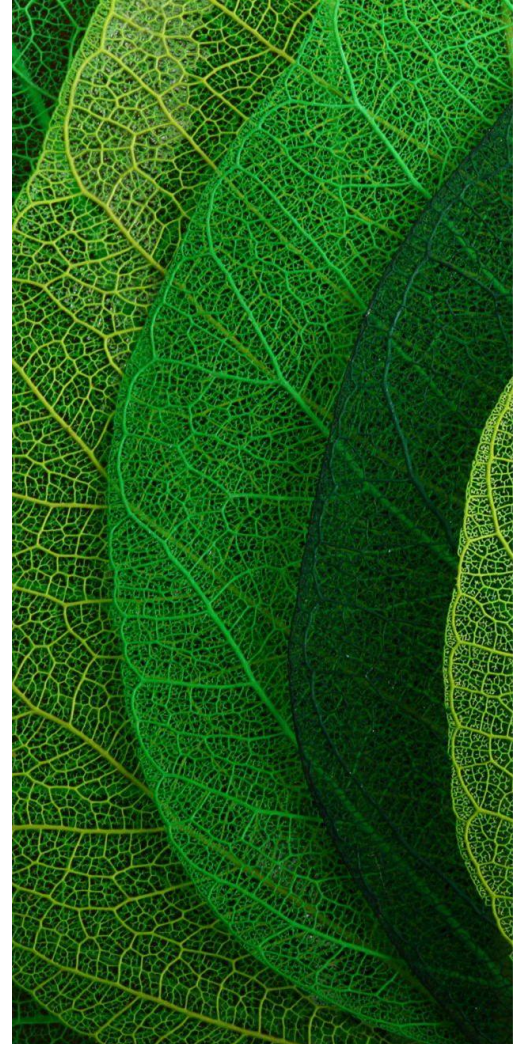


Summary

The UK excels in **academic research** and **university spinouts**.

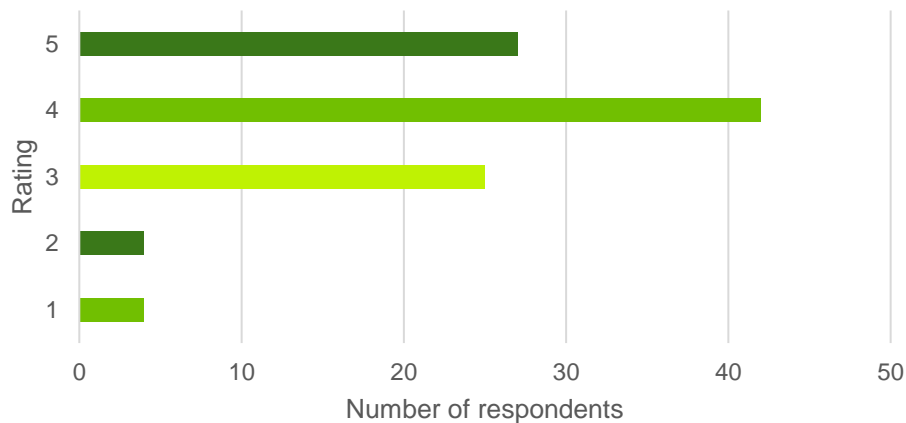
However, challenges remain:

- Few mechanisms for **industry-academia collaboration**, slowing commercialisation.
- **Absence of large domestic chemical players**, reducing sector viability.
- **Funding constraints**, limiting translational research impact.
- Bridging the gap between **research and industry** is essential for long-term success.



UK's ability to generate new knowledge

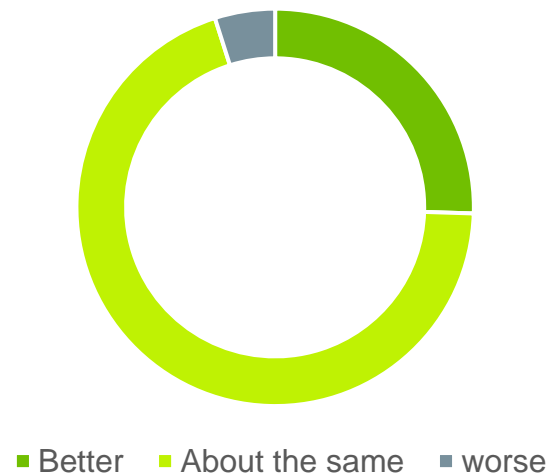
UK's ability to generate knowledge (1 bad, 5 excellent)



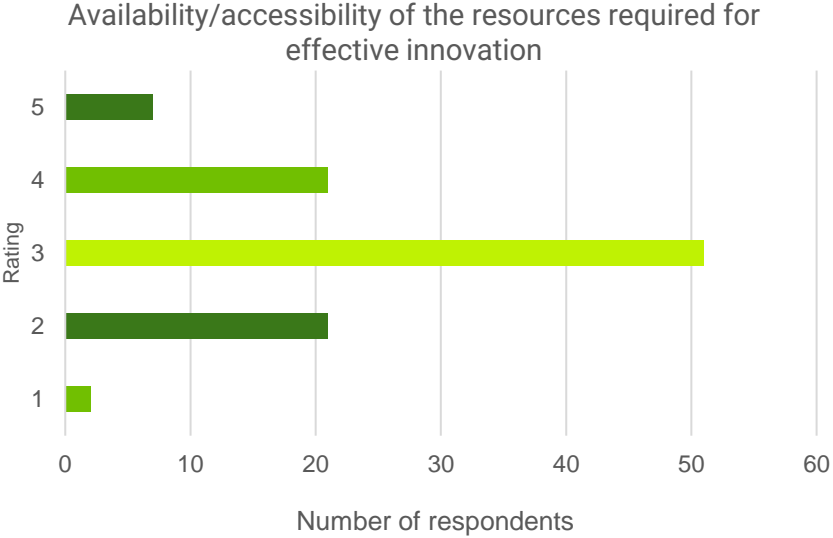
Average rating 3.82



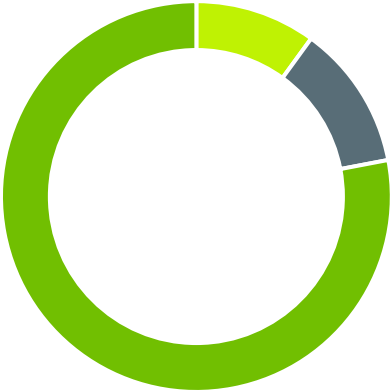
Ability to access expertise and generate knowledge compared to 12-months ago



Performance of UK's research and translational ecosystem



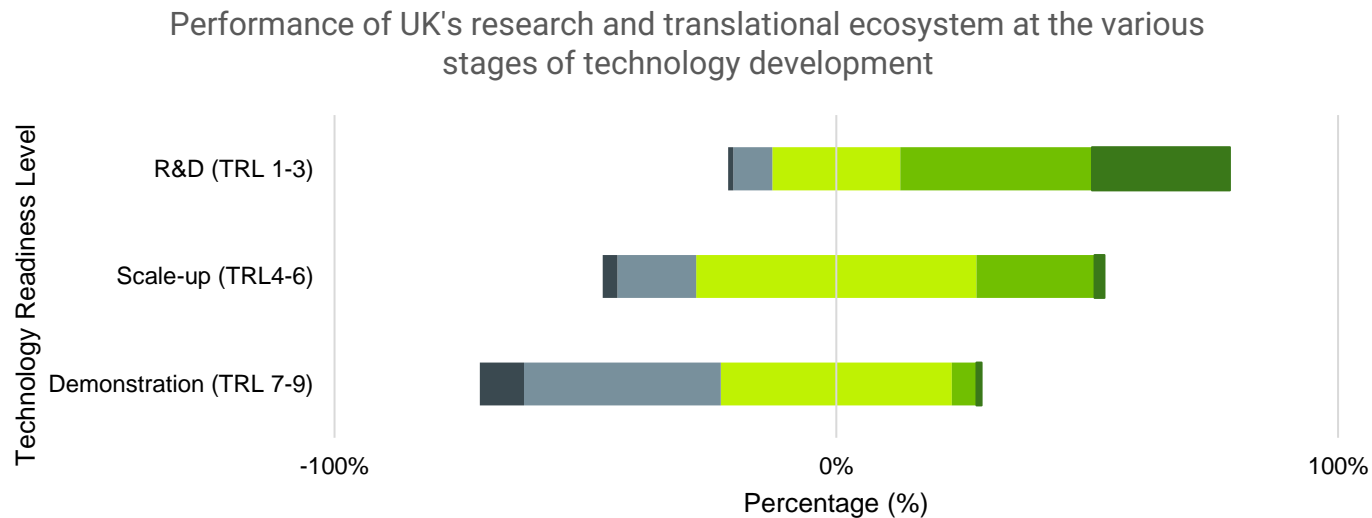
Ability to access resources compared to 12-months ago



■ Better ■ Worse ■ About the same

Average rating 2.9 ★★☆☆☆

Performance of UK's research and translational ecosystem



Excellent

Fair

Very Poor

Good

Poor



The UK remains poor at retaining value from the world leading R&D it generates. Measures to encourage greater deployment of risk capital across multiple rounds of financing, and with a less risk-averse approach would be welcome. Similarly, greater availability of public funding/co-funding, with a dramatic decrease in the stifling bureaucracy surrounding innovation funding would be helpful.

UK Academic and Founder of SME



06 Access to Resources

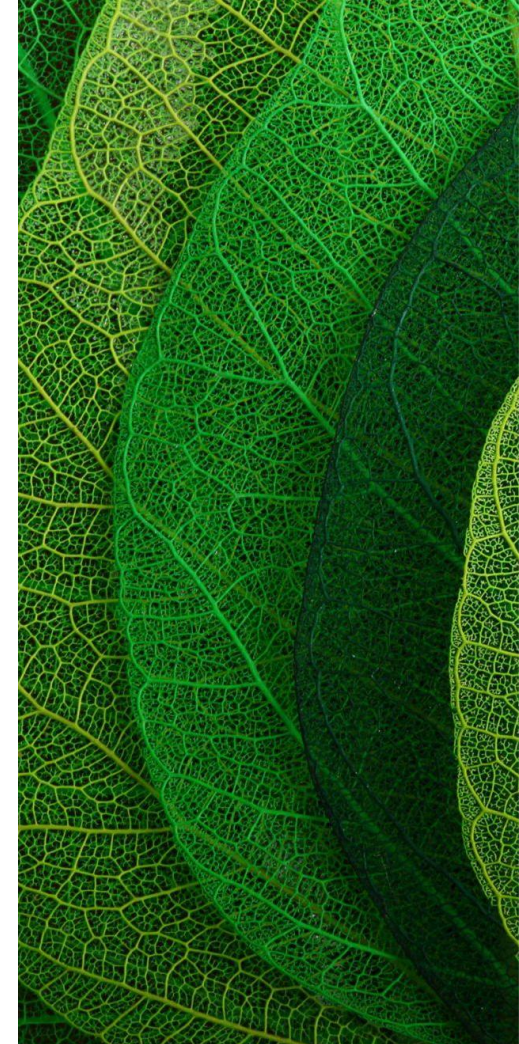


Summary

Access to **funding, infrastructure, and manufacturing facilities** remains a **major constraint** for UK bio-based startups.

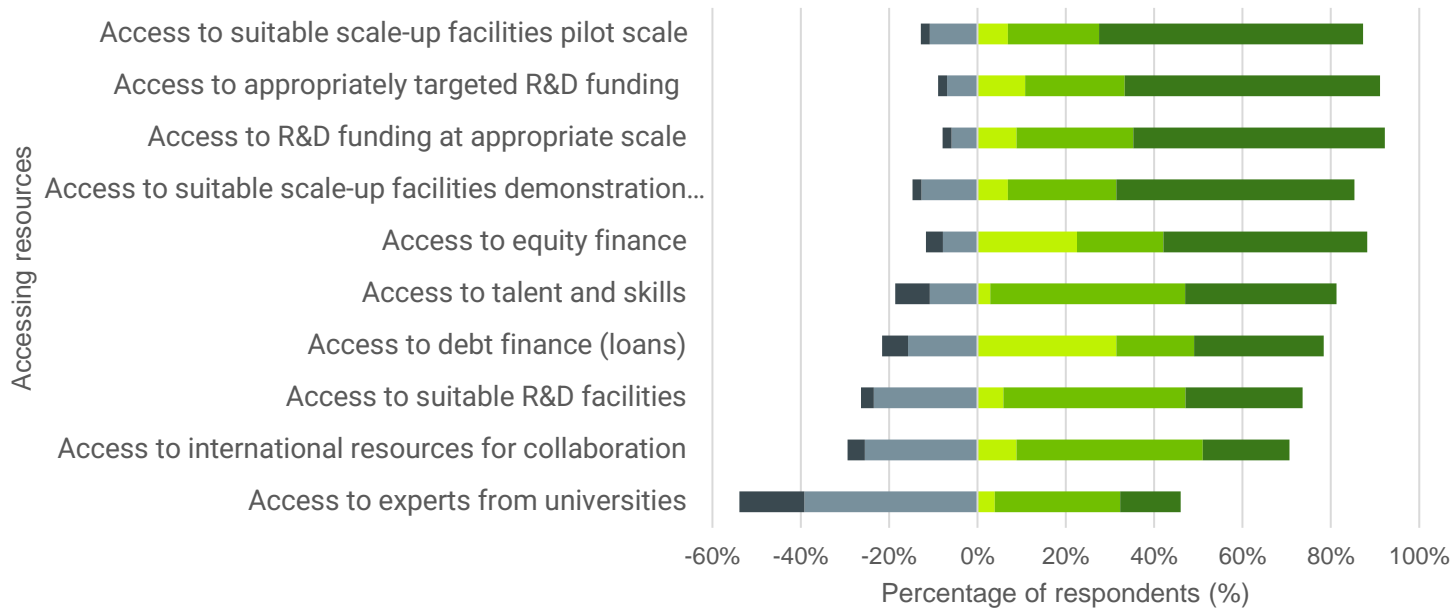
Key issues:

- **Limited domestic production capabilities**, forcing startups to **scale-up abroad**.
- **High operational costs**, (particularly energy costs) making UK-based manufacturing **less competitive**.
- **Slow and bureaucratic funding processes**, deterring potential innovators.
- More **investment-friendly policies** and improved **scale-up support** are needed.



Access to resources

Challenges in accessing resources





Some scale-up facilities are available, but they are generally supplied at full market rate, making them only accessible via a government-funded grant or additional investor support. Catapults have targets to meet, so it is easier for them to go after big players with big budgets and overlook the 'troublesome and needy' SMEs. To properly support SMEs in the UK, access to scale-up infrastructure needs to be heavily subsidised or means-tested to improve access.

CEO, Bio-based SME



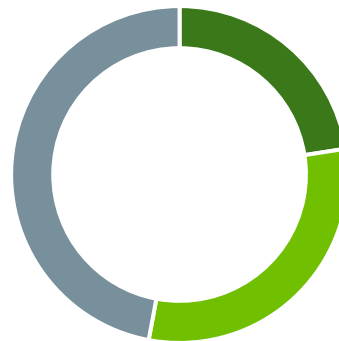
Scaling-up and manufacturing outside of UK

Have you, in the last 5 years, chosen to utilise R&D, or scale-up facilities outside of the UK?



■ Yes ■ No ■ Not applicable

Have you, in the last 5 years, chosen to manufacture outside of the UK?



■ Yes ■ No ■ Not applicable



We need better funding approaches for scale-ups. Simple changes—like removing the 30% cap on Research and Technology Organisation support in Contract R&D grants—could greatly improve access to critical resources. Current limits force businesses to reduce ambition due to these funding constraints. While programs like Innovate Edge help by covering 100% of RTO costs, their £15k project cap is also incredibly restrictive. The solution is within reach; we just need to align the right elements!

Director, Pilot Facility



07 Entrepreneurial Activity

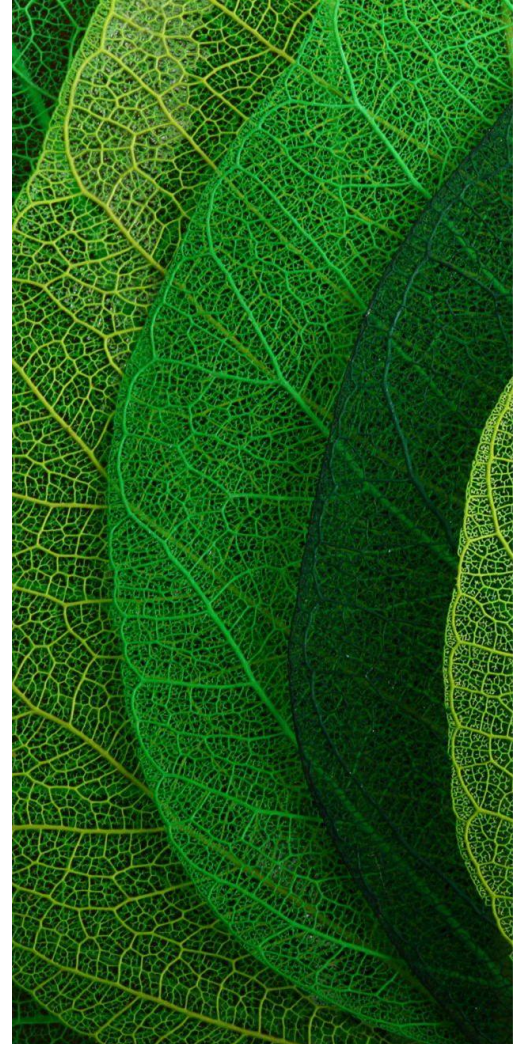


Summary

Entrepreneurial activity in the bio-based sector is **moderate** (rated **3.02/5**).

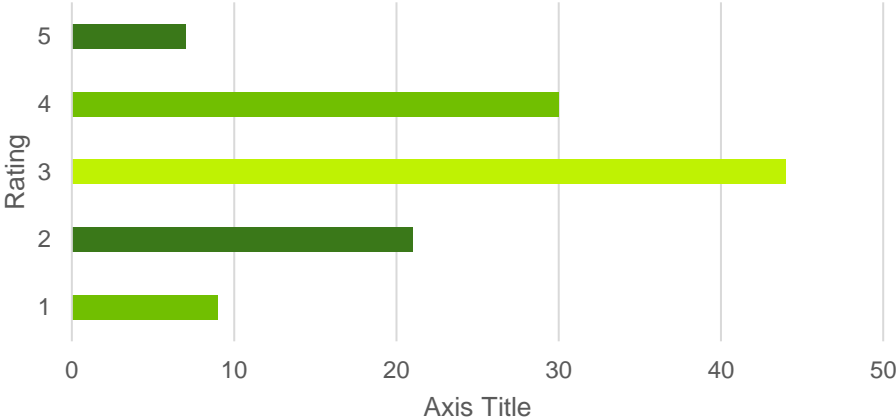
Challenges include:

- **Risk-averse investors**, leading to **funding shortfalls**.
- **Slow market adoption**, limiting revenue potential.
- **Regulatory complexity**, making startups hesitant to invest in the UK.
- A **stronger venture capital ecosystem** and **reduced regulatory burden** could encourage growth.



Entrepreneurial activity

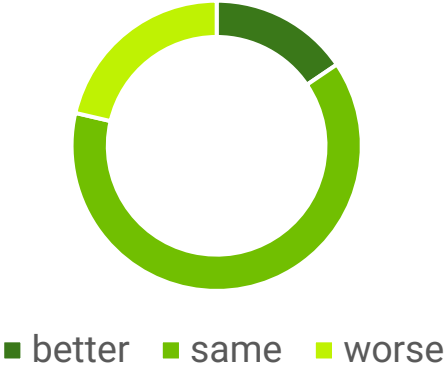
Ability and effectiveness of the UK to support entrepreneurial activity



Average rating 3.02



Ability and effectiveness of the UK to support entrepreneurial activity, compared to 12-months ago



08 Policy and Regulatory Environment

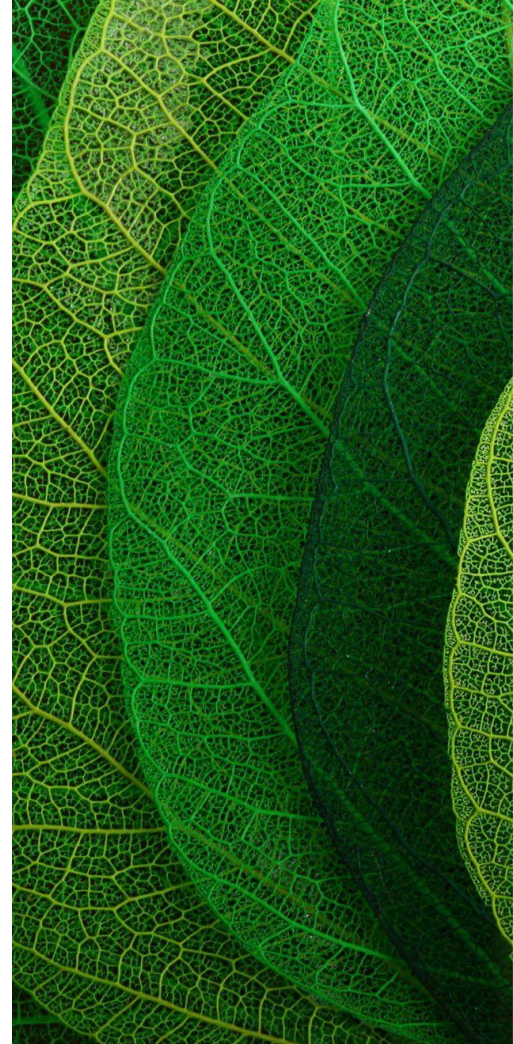


Summary

The UK's **bio-based policy framework** is inadequate (**rated 2.49/5**), with no strong incentives, or positive regulations for market development.

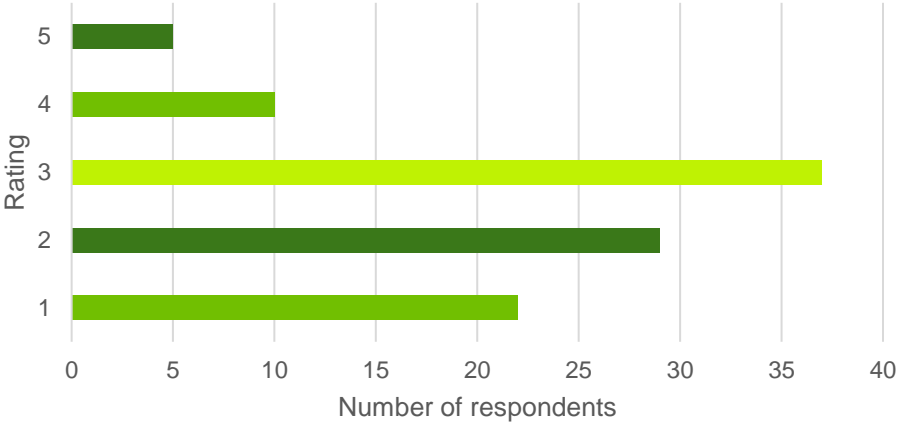
Key concerns:

- **Narrow policies, spreading several government departments**, failing to accommodate innovative materials, and favouring fossil incumbents.
- **No government-backed positive policies** for bio-based alternatives.
- **Lack of clear sustainability targets** for the industry.
- A **multi-faceted, collaborative policy approach** is required to drive industry adoption.



UK Strategy, policy and regulatory landscape

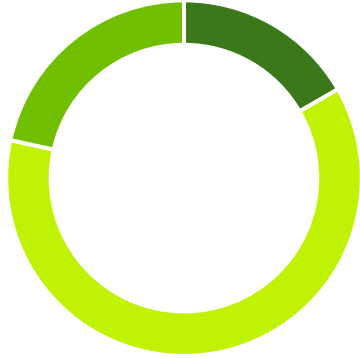
Do UK policy, strategies and regulations support BB-Materials sector? (1 bad, 5 excellent)



Average rating 2.49



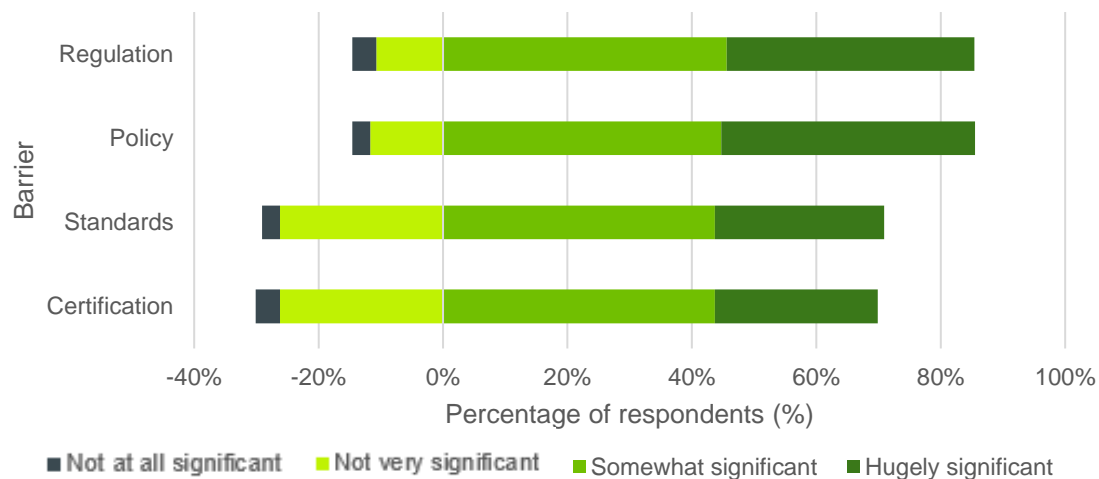
Policy and Regulatory Environment in the UK compared to 12 months ago



■ better ■ same ■ worse

UK Strategy, policy and regulatory landscape

Barriers for commercialisation of Bio-based and Biodegradable Materials





There are currently no incentives for bio-based materials, and the UK's policy and regulatory environment is too narrow, failing to accommodate innovative bio-based solutions. For success, we must adopt a collaborative, multi-faceted approach. While recycling, reusing, and reducing are important strategies, they alone are insufficient—bio-based materials will play a critical role in achieving sustainable progress.

Senior Manager, Large Bio-based Corporate



09 Legitimacy of Sector

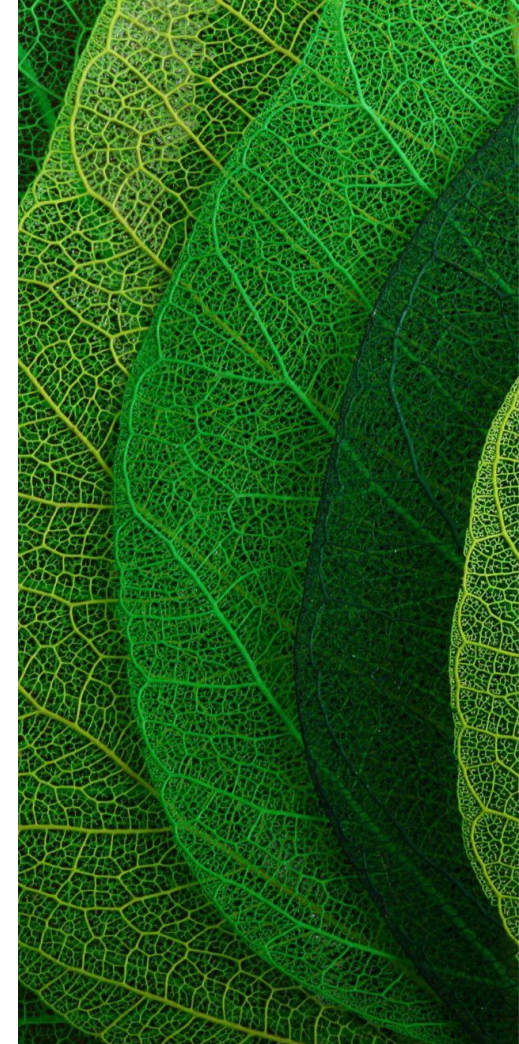


Summary

Public understanding of bio-based materials is **limited** (rated **3.16/5**).

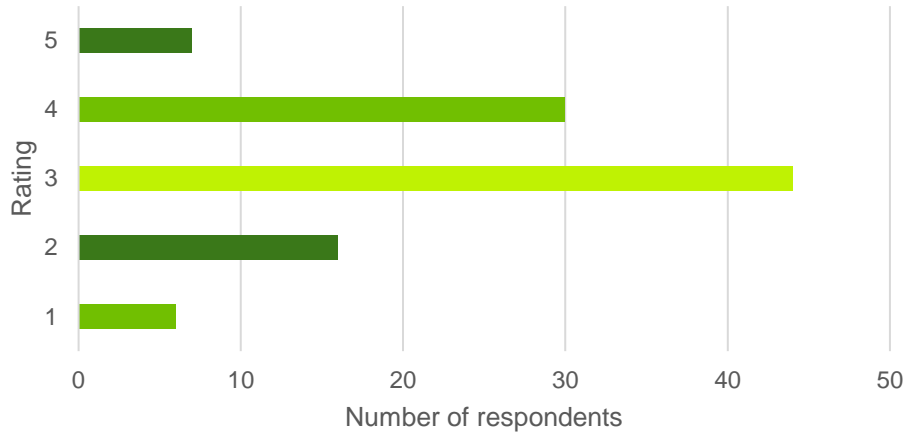
Challenges:

- **Confusion between bio-based, biodegradable and compostable materials**, slowing adoption.
- Organic recovery and organic recycling infrastructure varies geographically on whether it accepts compostable materials.
- **Retail and consumer scepticism**, hindering market uptake.
- **Education, awareness campaigns, and proper waste management solutions** are crucial for improving sector legitimacy.



Legitimacy of the sector

Perception of key stakeholders (policymakers, politicians, citizens) about BB-Materials (1 bad, 5 excellent)



Average rating 3.16

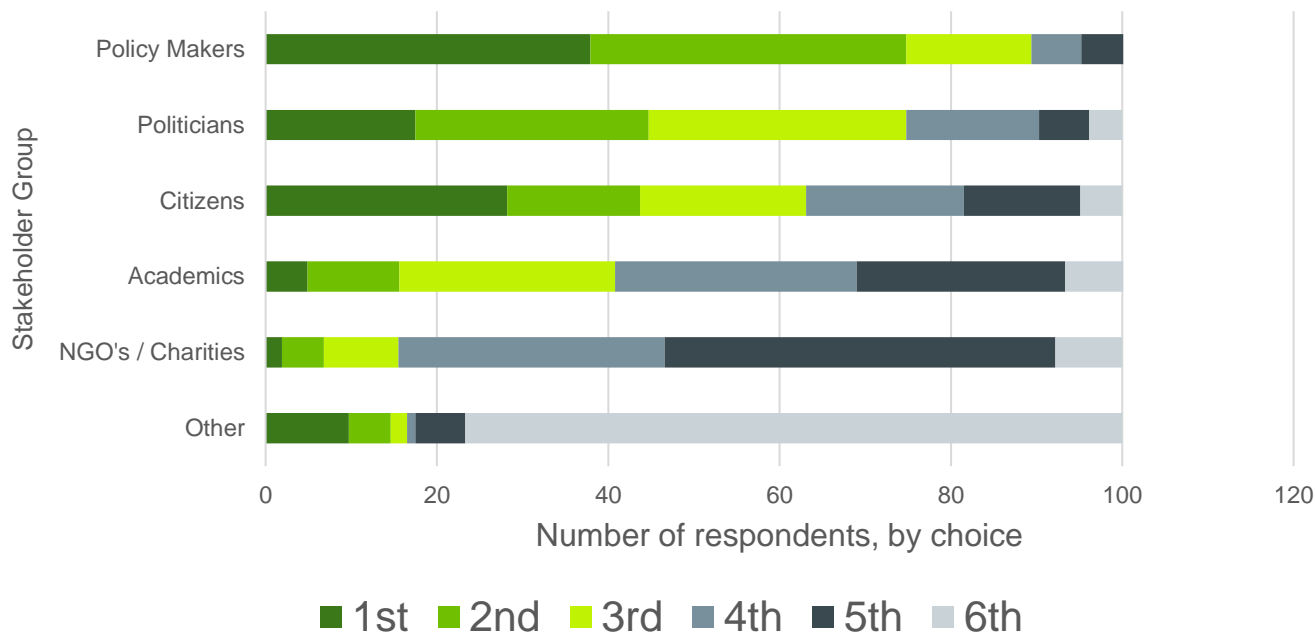


Perception compared to 12 months ago



Legitimacy of the sector

Stakeholders most important in determining the legitimacy of Bio-based and Biodegradable innovations in your innovation space





There is a significant lack of education and widespread confusion between bio-based materials and biodegradability. Bio-based does not equate to poor, sub-standard performance, unfortunately, this misconception is one we must address on a daily basis.

Manager, Bio-Based SME



10 Communication and Dissemination

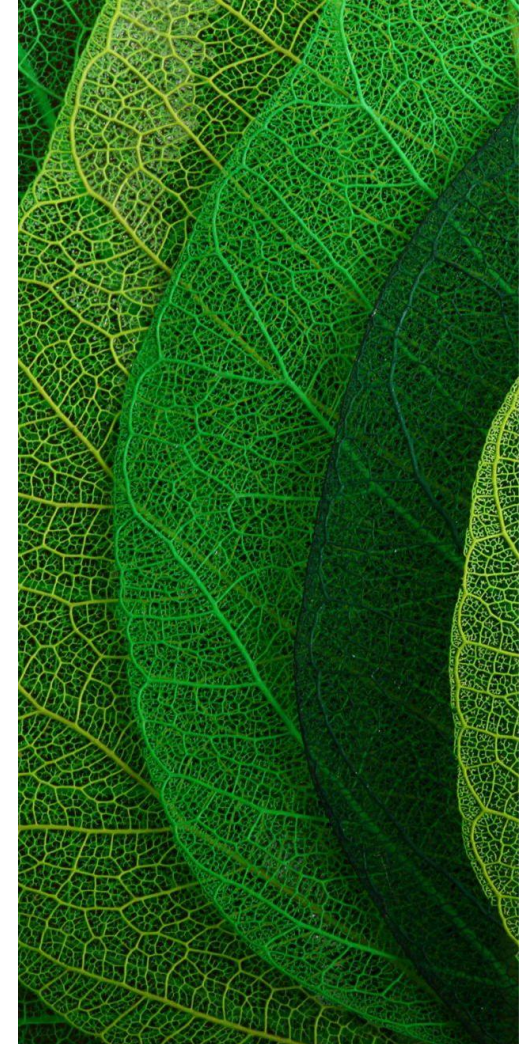


Summary

Stakeholders believe communication efforts are **moderately effective (rated 3.39/5)**, but **more needs to be done** to improve public and industry engagement.

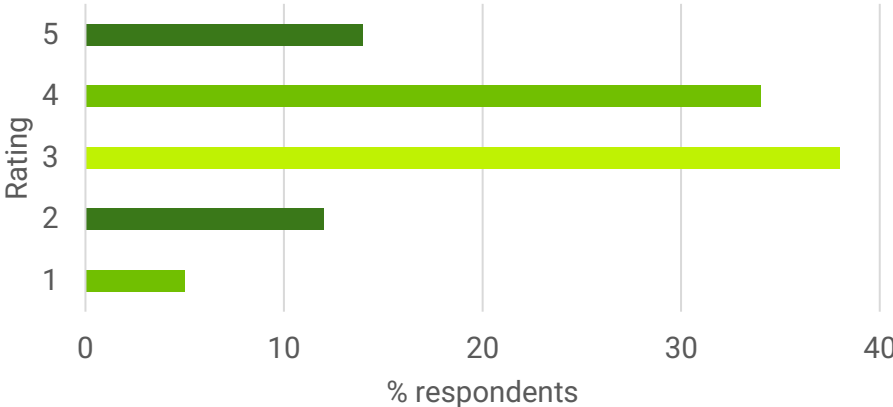
Current gaps:

- **Insufficient consumer education** on sustainable bio-based and biodegradable material benefits.
- **Lack of transparent industry data**, creating uncertainty for investors.
- **Need for clearer sustainability messaging** to counter misinformation.
- Better **communication strategies** and **public engagement initiatives** can drive industry growth.



Communication and dissemination

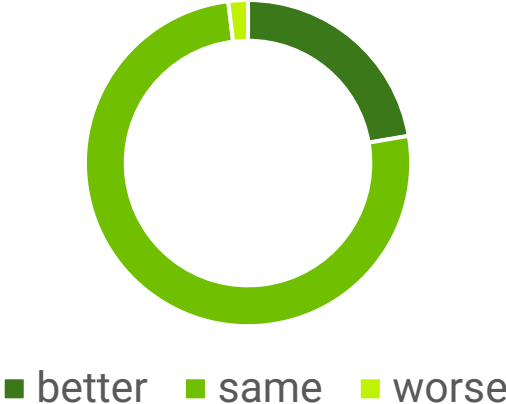
UK's ability to communicate and disseminate knowledge



Average rating 3.39

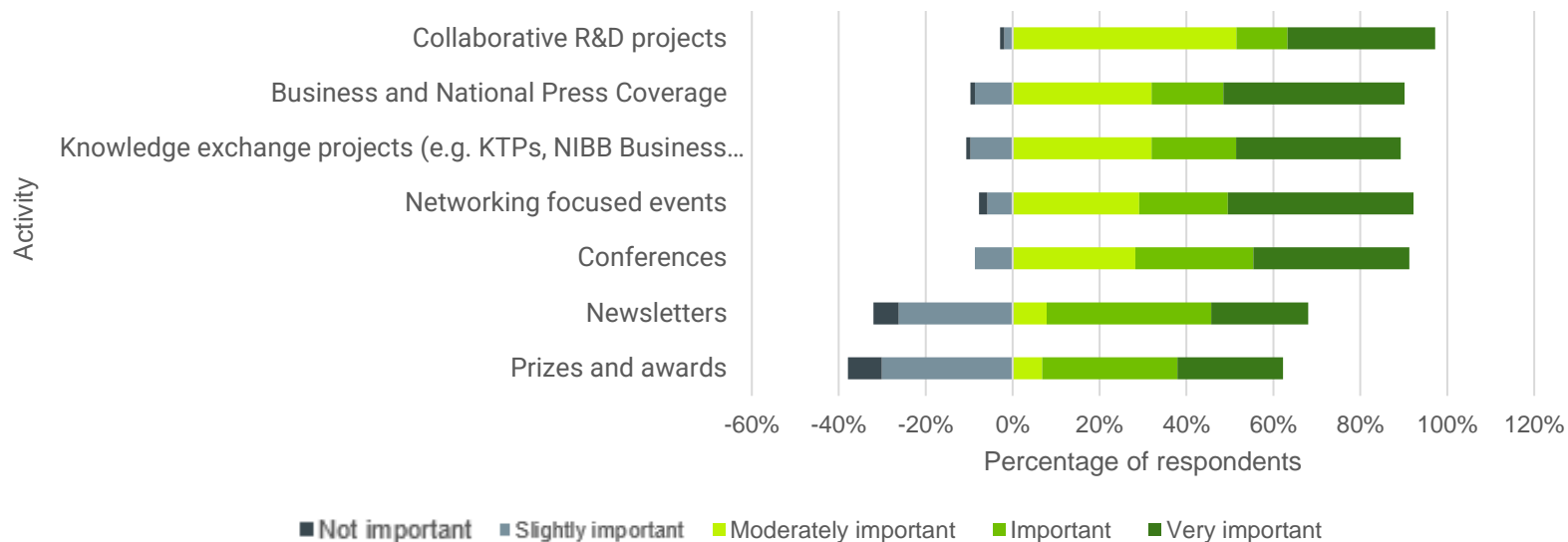


UK's ability to communicate and disseminate knowledge, compared to 12-months ago



Communication and dissemination

Most important communication and dissemination activities





While there is some movement in the policy space for improving the role of bio-based materials, it will still rely heavily on citizen's knowledge and behaviour, and at the moment, there are still a lot of problems in terms of correct disposal method for packaging options in supermarkets. This will need to improve to ensure the benefits of bio-based materials are realised.

Manager, NGO



11 Future of the Bio-Based Sector

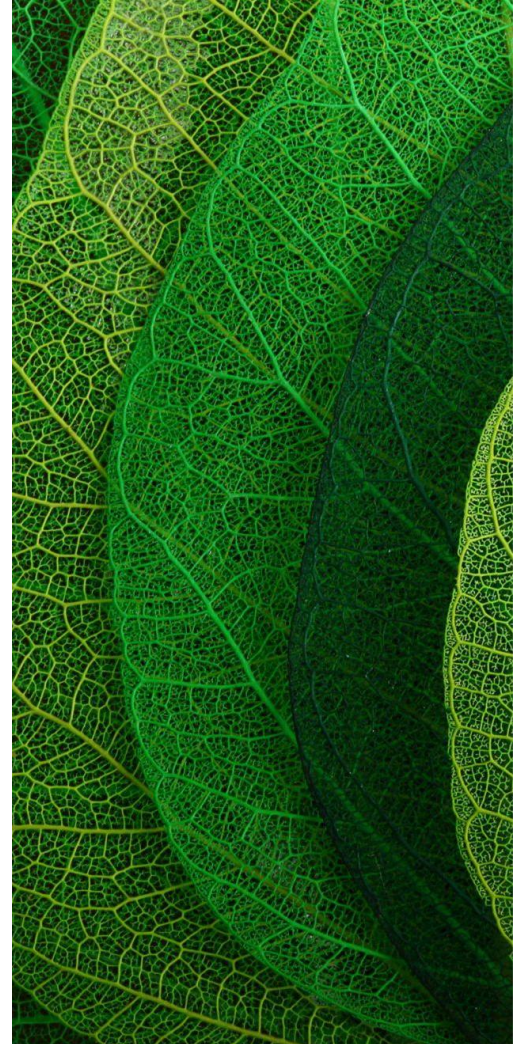


Summary

The sector is **crucial for the UK's long-term sustainability and economic growth** but lacks the necessary support to **scale and compete globally**.

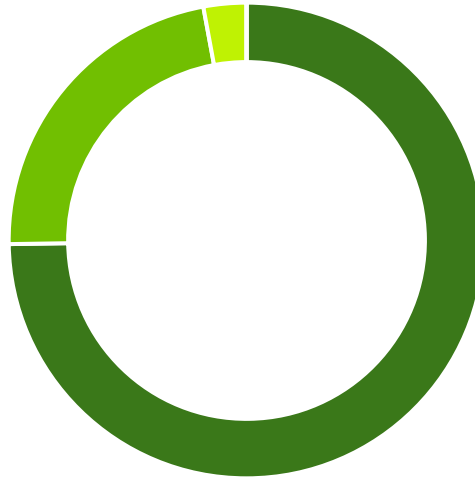
Key recommendations:

- **Increase government funding** with fewer bureaucratic hurdles.
- **Introduce positive regulations** to encourage investment and market adoption.
- **Foster collaboration** between academia, startups, and industry leaders.
- **Improve access to risk capital** and multi-round investment opportunities.
- The UK must **act now** to retain its **R&D leadership** and prevent losing competitive advantage to other regions.



Future of the sector

How important do you think the bio-based and/or biodegradable sectors and the bioeconomy is to the UK achieving its ambitions for clean growth and a greener future over the next 10 years



- Extremely important
- Very important
- Somewhat important
- Not so important
- Not at all important



This sector is likely to be hugely important to UK Plc over the next decade, and we need policymakers and UK government to support this fledgling industry with easier access to scale-up support and legislation that encourages uptake.

Director, Large UK Bio-based Corporate



12 Conclusions and Way Forward



Conclusions

The following conclusions and policy suggestions have been developed as a result of the survey outputs in conjunction with key stakeholders.

The survey underscores the **need for stronger policy, investment, and industry support** to unlock the potential of bio-based and biodegradable solutions.

Immediate action is required in:

- **Policy reform** to introduce clear incentives.
- **Improving funding mechanisms** for startups and scale-ups.
- Engagement with the **recycling sector**.
- **Enhancing public understanding** to drive demand.
- By addressing these challenges, the UK can position itself as a **global leader in sustainable bio-based innovation**.

Policy suggestions to accelerate bio-based innovation

1

Best use of Biomass

- Develop a unified **cross-departmental biomass utilisation hierarchy** and associated joined up policies and regulatory environment that ensures biomass and biowastes are prioritised for high value chemicals and materials, to derive the maximum value from our bio-resources.

2

Regulatory Clarity and Support

- Improve **regulatory clarity** for bio-based chemicals, materials and processes.
- Align **EU & UK REACH** to support international competitiveness.
- Develop **clear definitions and standards** for bio-based and biodegradable materials to ensure market consistency and consumer confidence.

3

Research, Innovation, and Skills Development

- **Increase funding for research** into new bio-based materials and technologies.
- Develop **skills training programs** to equip the workforce for an evolving bioeconomy.

4

Infrastructure Accessibility and Development

Improve accessibility of **pilot and scale-up infrastructure** for SMEs through:

- **Better information sharing** on available open-access infrastructure.
- **Public funding support** to reduce costs for SMEs accessing these facilities.
- **Smart sharing mechanisms** to encourage universities and infrastructure holders to provide access.

5

Funding and Investment

- **Ringfenced public funding** for bio-based innovations through Innovate UK.
- Establish a **bio-based innovation team** within British Patient Capital and National Wealth Fund for targeted investment.
- **Implementation of Mansion House Reforms** to unlock capital for bio-based ventures.

6

Market Development and Public Procurement

- Introduce **financial tax incentives** and positive regulations to encourage investment in and adoption of bio-based innovations, including, **Tax incentives** for bio-based products, ensuring SMEs benefit from **research-intensive R&D tax relief rates** and implementation of **government procurement policies** that prioritise bio-based products..
- Launch **public awareness campaigns** to educate businesses and consumers on bio-based products, and their end-of-life correct disposal.

7

Waste Management and Circular Economy

- Develop **integrated waste policies** to support the collection and processing of bio-based and biodegradable materials.
- **Invest in composting infrastructure** to manage biodegradable waste volumes.

8

International Collaboration and Trade

- **Harmonise international regulations** for bio-based and biodegradable materials to facilitate trade and market access.
- Provide **export support** for UK bio-based manufacturers through trade missions and incentives.
- Incentivise exports through inclusion of bio-based products in trade agreements.



Working in the bioeconomy industry in the last year, there is a lot of expertise and general knowledge. However, given the current legislation, a lot of expertise is not currently expanding in the UK, but rather in Continental Europe where there is a more favourable outlook for bio-based and biodegradable materials.

The UK risks losing billions more of pounds.

Commercial Director, UK Bio-based SME





Get in touch



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