Rialtas na hÉireann
Government of Ireland

Bioeconomy Action Plan

Consultation and Discussion Document

2022

Prepared by the Department of
Environment, Climate and Communications
gov.ie

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1 Purpose of the Consultation and Discussion Document

The Programme for Government, Our Shared Future, recognises that the next ten years are critical if Ireland is to address the climate and biodiversity crisis. In addition to marking a step-change in the level of Ireland's Climate Action ambition, the Programme committed to actions to ensure that Ireland is at the cutting edge of scientific and technological innovation in meeting our climate change targets, including in the bioeconomy.

Accordingly, the Department of the Environment, Climate and Communications (DECC) and Agriculture, Food and the Marine (DAFM) and the Bioeconomy Implementation Group (BIG) is seeking input from interested parties both public and private, in line with Aarhus guidelines in respect of public engagement, through this consultation and discussion document.

This consultation and discussion document will help inform the final content of the Bioeconomy Action Plan 2023-2025, as well as longer-term policy development in relation to the bioeconomy.

1.1 How to respond

The departments are committed to engaging with stakeholders in a clear, open and transparent manner. This discussion document has been published on the government of Ireland website (gov.ie). Interested parties are invited to provide submissions by e-mail or post to the Department of the Environment, Climate and Communications by 27 January 2023, at the latest.

Submissions may be made based on the questions set out in this paper and it is not necessary to answer all questions. Additional comments outside the questions posed are also welcome. When responding to the questions outlined in this consultation document, please ensure answers to each question are less than 250 words where possible. Submissions are subject to Freedom of Information legislation and will be published.

E-mail address: bioeconomy@decc.gov.ie

Alternatively, submissions may be made in writing to the following address:

Bioeconomy Action Plan Consultation
Land Use and Sectoral Policy Division
Department of Environment, Climate and Communications
29-31 Adelaide Rd, Saint Kevin's, Dublin, D02 X285.

1.2 Closing Date

The public consultation will close at **5.30pm on Friday 27 January 2023**.

1.3 Data Protection

We are committed to engaging with stakeholders in a clear, open and transparent manner. Any person or organisation can make a submission in relation to this consultation. All submissions and feedback will be considered before the final version of the Action Plan is published.

Please note that responses to this consultation are subject to the provisions of the Freedom of Information Act 2014 (FOI), Access to Information on the Environment Regulations 2007-2018 (AIE) and the Data Protection Act 2018.

Please also note that we intend to publish the contents of all submissions received to our consultations on our website. We will redact personal data prior to publication. In responding to this consultation, parties should clearly indicate where their responses contain personal information, commercially sensitive information or confidential information which they would not wish to be released under FOI, AIE or otherwise published.

We would like to draw your attention to our Data Privacy Notice which explains how and when we collect personal data, why we do so and how we treat this information. It also explains your rights in relation to the collection of personal information and how you can exercise those rights.

1.4 Next Steps

Following the consultation, DECC, DAFM and the BIG will consider all responses received and make a submission to the Minister for the Environment, Climate and Communications and Agriculture, Food and the Marine. The Ministers will then submit the final version of the Action Plan to government for approval prior to its publication.

2 Bioeconomy Description

The bioeconomy covers all sectors (including agriculture, horticulture, forestry, fisheries & aquaculture) and systems (including nature, land, food, energy, built environment, health) that rely on biological resources (from animals, plants, insects, micro-organisms and derived biomass, organic waste), their functions and principles.

The bioeconomy encompasses these sectors, systems, associated services and investments to conserve, produce, regenerate, use, process, distribute or consume biological resources including ecosystem services. Bioeconomy allows economic and social value to be added to biological resources providing sustainable solutions (including information, products, processes, and services) in and across all economic sectors in a sustainable, renewable, and circular manner.

The bioeconomy considers our use of biological resources in a holistic way, supporting food and nutrition security, mitigating, and adapting to climate change, reducing dependence on non-renewable unsustainable resources, managing natural resources sustainably and strengthening competitiveness, creating jobs, and supporting a just transition.

As such it is a natural enabler of the transformation to reach net-zero emissions by no later than 2050, as committed to in the Programme for Government and the Climate Act 2021. It is also an enabler for the Circular Economy Act 2022 that sets out the shift to a more sustainable pattern of production and consumption, including to reduce raw material consumption, to retain the value of resources in the economy for as long as possible and to significantly reduce greenhouse gas emissions. It is also a goal in Food Vision 2030 which seeks to 'embed the agri-food sector in a circular, regenerative bioeconomy'.

3 National Policy Statement on the Bioeconomy

The National Policy Statement on the Bioeconomy published in 2018, with its cross-sectoral, complementary, and systemic vision, guiding principles and perspective, sought to develop the bioeconomy in Ireland to address several strategic policy objectives including sustainable development, decarbonisation, and environmental, economic, and social sustainability. The policy statement was developed in the context of the update of the EU Bioeconomy Strategy in 2018 and its focus on deployment of local bioeconomies across Europe.

In this context, the government established a high-level cross government Bioeconomy Implementation Group (BIG) jointly chaired by the Departments of the Environment Climate

and Communications (DECC) and Agriculture, Food and the Marine (DAFM). The principal task of this group was to bring forward recommendations to develop the bioeconomy further and bring policy coherence to all relevant sectors. Subsequently, the BIG established a bioeconomy forum and a bioeconomy network to liaise and raise awareness with relevant industry bodies and community stakeholders within the bioeconomy.

The national policy statement originally identified that the Irish bioeconomy was at an early stage of its progression, but it did not identify individual sectors or targets which should be advanced, as this was considered premature. Instead, the policy statement sought a concentration on developing the key **implementation pillars** of the bioeconomy and ensuring that these received the consistent attention of government. Those pillars are:

- Investments in research, innovation, and skills
- Development of markets and competitiveness
- Reinforced policy co-ordination and stakeholder engagement

It was also envisaged that next steps involved looking at how the **commercial viability of the bioeconomy** could be extended and intensified as Ireland moved towards the objective of embedding environmental and climate actions in rural, coastal, and regional areas and developing a climate-neutral and decarbonised economy by 2050.

The policy statement outlined key actions and several challenges to be addressed to ensure the development and the success of the bioeconomy in Ireland initially focused on the implementation pillars.

The BIG has regularly reported on the implementation of the National Policy Statement on the Bioeconomy in Ireland, with a first progress report published in 2019. The findings of a more recent report produced in 2022 is highlighted in the next section. The BIG has also engaged with relevant state agencies, semi-state commercial companies, research centres, clusters, and platforms to analyse their actions in developing the bioeconomy and to identify challenges and barriers they faced in doing so.

4 Progress so far

Bioeconomy Implementation Group Progress Report

The 2nd Bioeconomy policy implementation report to government outlines supportive governance approaches through:

- governmental coordination and stakeholder consultation

- increased sectoral policy coherence supporting strategic development and policy integration
- further development of existing bioeconomy initiatives such as research centres and the funding of new education opportunities, collaborative projects, clusters, and networks to enable scientific, technological and innovation development and diffusion of knowledge
- increased awareness raising through Bioeconomy Ireland Week and other awareness raising events
- the development of modelling and monitoring approaches to support bioeconomy development; and
- engagement in north-south, EU & international bioeconomy development

The report outlines a need to ensure enhanced strategic development of the bioeconomy through **mobilisation activities** including through investment in scaling up innovation and deployment of infrastructure.

The Bioeconomy Forum Report

The Bioeconomy Forum also developed a report through its members, who broadly represent the bioeconomy, supported by an Expert Advisory Group. This report outlines that currently the Irish bioeconomy has several lead innovators adapting to economic, social, and environmental challenges by demonstrating commercially viable bioeconomy opportunities. Despite this range of innovative developments, it identifies these developments as not sufficiently widespread nationally and highlights the need for further awareness raising efforts and stimulus measures to address a range of challenges. The Forum report identifies fifteen elements to be addressed.

Fast Track to Policy Report

Alongside the BIG and Forum reports, a Fast Track to Policy report titled Circular Bioeconomy Outlook Study 2030-2050 in support of Climate Action, Sustainable Food and Biobased Systems was commissioned. This report identifies that in the crisis-to-crisis period we are living through, including the climate and biodiversity emergencies, a sustainable and circular bioeconomy can help build resilience in our local biological resources, environment, economy, and society. The report presents a snapshot of potential innovation scenarios (feedstocks, conversion technologies, biobased products) for Ireland’s bioeconomy over the

2030-2050 period. It also provides recommendations to inform policy development for the further development of a sustainable and circular Irish bioeconomy (including development of specific regional outlooks, public-private partnerships, deep demonstrations, education, training & skills development, and business model development for the inclusion of primary producers & businesses).

EU and International Bioeconomy Developments

The bioeconomy is fully embraced at EU level and an EU Bioeconomy Strategy progress report was published in 2022. This progress report highlights progress made but also important gaps that should be considered in the development of the Action Plan 2023-2025. Additionally, it is important to note that bioeconomy development is also progressing at an international level beyond the EU recognising the role of bioeconomy in transforming food systems and for climate action but also as appropriate bioeconomy development is necessary in a context of much larger changes of societal, technological, and economic transformations.

EU Bioeconomy Strategy Progress Report

In February 2018 an updated EU Bioeconomy Strategy outlined actions to scale up and deploy the bioeconomy including to:

- strengthen and scale-up the bio-based sectors, unlock investments and markets
- deploy local bioeconomies rapidly across Europe
- understand the ecological boundaries of the bioeconomy

In 2022, considering the new EU Green Deal policy context, the European Council asked the European Commission to provide a progress report on the implementation of the EU 2018 Bioeconomy Strategy and to assess whether the Strategy and/or its Action Plan requires updating. The strategy progress report identified that overall implementation of the EU Bioeconomy Action Plan was well on track and has already contributed to the objectives of the European Green Deal with the strongest progress made in developing bio-based solutions through research & innovation and increasing public and private investments (action area 1). Improved cooperation with Member States and demonstration projects was also noted as laying the basis for regional and national bioeconomy deployments, with a focus on less developed countries (action area 2). Additionally, understanding of ecological limits of the bioeconomy has improved (action area 3). However, gaps remain on how to

better manage biosphere use to meet environmental and economic requirements in a climate neutral Europe, and how to promote more sustainable consumption patterns to guarantee environmental integrity.

International Developments

Internationally, the Food and Agriculture Organisation (FAO) of the United Nations has identified 'Bioeconomy for Sustainable Food and Agriculture' as a programme priority area within its Strategic Framework 2022-2031, which steers the FAO's efforts to transform agri-food systems and promote a food secure world for all, as envisioned by the 2030 Agenda on Sustainable Development. The Intergovernmental Panel on Climate Change (IPCC) also featured "bioeconomy" for the first time in their Sixth Assessment Report on climate change. The US and China have also announced policy initiatives on the bioeconomy in 2022.

5 Why is an Action Plan needed?

The Programme for Government, the Climate and Low Carbon Development Act 2021 and the Circular Economy and Miscellaneous Provisions Act 2022 set the ambition for Ireland to become climate neutral by 2050, safeguarding people, planet, and prosperity. The Climate Action Plan 2021, Food Vision 2030, and the Circular Economy Strategy outline, through their actions, that the transformation to a modern, resource-efficient, and resource sufficient, prospering, and competitive economy, in which environment, health and wellbeing are priorities, requires deep and widespread action across all sectors of the economy. This consultation and discussion document highlight that the National Policy Statement on the Bioeconomy actions are on track to structure bioeconomy development, but that further mobilisation actions and systemic activities are required to achieve its overall strategic objectives.

In the main, there is still a lack of broad public, community and industry understanding and awareness of the bioeconomy opportunity. There is also a need to enable clear regulatory and innovation pathways for the bioeconomy to support the potential of bio-based solutions to address climate action issues and environmental challenges in specific territorial contexts. Taking consideration of existing regulatory requirements and identifying areas to be potentially addressed to support bioeconomy while not impacting on the environment or having unintended consequences.

Improved integration and coherence are also required between bioeconomy and waste, energy, and chemicals systems transformation. Overall, the bioeconomy offers opportunities to mitigate carbon emissions, sequester carbon in land and seas, store renewable carbon in biobased products and substitute the use of fossil fuel or carbon intensive alternatives. It is also a broad, dynamic, cross-sectoral network of activities which spans across our entire economy, intersecting with climate, nature, energy, agriculture, chemicals, enterprise, funding and finance, education, research, demonstration and innovation, regulation, and planning.

In the Climate Action Plan 2021 and Food Vision 2030, DECC, DAFM and the cross-government High-Level Bioeconomy Implementation Group (BIG) committed to developing a detailed and tailored three-year Bioeconomy Action Plan, which would progress Ireland beyond the phase of development since the publication of the National Bioeconomy Policy Statement in 2018. This Plan will seek to address the challenges and opportunities identified for bioeconomy development and will socialise these issues at a public level. The Action Plan will deliver actions out to 2025, halfway through this formative and important decade for both climate action and also the development of sustainable and circular food and bio-based systems. The Action Plan will consider the progress we have made thus far in implementing the National Policy Statement and will set us on a pathway towards realising the potential for this significant component of our economy.

6 Pillars of the Bioeconomy

As Ireland's bioeconomy has developed over recent years, new implementation pillars have emerged going beyond the original National Policy Statement's policy **implementation framework,** which were: **Investments in research, innovation, and skills**; **Development of markets and competitiveness**; and **Reinforced policy co-ordination and stakeholder engagement**. Each of these original pillars and the newly proposed or expanded pillars pose their own challenges and opportunities, which require specific actions and the cooperation of specific actors over the coming three-year period.

Each of these pillars cannot progress without direction from the other, and therefore they are coordinated around the central pillar of Governance. It is envisaged that the Governance pillar will address key cross-cutting issues which impact across all other Pillars, while each individual Pillar will deal with bespoke issues relating to that area of the bioeconomy including deepening the integration of bioeconomy in the respective policy areas.

The proposed pillars of the Action Plan are:

1. **Governance Pillar**
2. **Research, Development & Innovation Pillar**
3. **Nature, Climate & Circular Pillar**
4. **Agriculture, Forestry & the Marine Pillar**
5. **Communities Pillar**
6. **Industry & Enterprise Pillar**
7. **Knowledge & Skills Pillar**

Figure 1 Pillars of the Bioeconomy, BIG Secretariat 2022.

Question 1: Are you satisfied the outlined Pillars represent the structure of the Irish bioeconomy?

6.1 Policy Framework

A Vision for a Successful Bioeconomy in Ireland

The government's vision for the bioeconomy is to grow Ireland's ambition to be a global leader for the bioeconomy through a co-ordinated approach that harnesses Ireland's natural resources, and competitive advantage and that fully exploits the opportunities available while monitoring and avoiding unintended consequences. An important objective of the bioeconomy is to move Ireland beyond simply focusing on complying with targets, to integrating sustainable economic development into our economic model as we transition to a low carbon and circular economy.

There is increasing recognition at a European level of the potential benefits for economies and societies of adopting a circular economy that maintains the utility and value of products, components and materials in the economy for as long as possible. The bioeconomy has a close relationship with the circular economy and represents an area where Ireland has some crucial advantages. The bioeconomy should promote circularity through solutions and innovations that reuse and recycle materials, maximising resource efficiency through the use of unavoidable wastes and environmental sustainability.

Principles Underpinning the Bioeconomy

- **Sustainability Principle:** Environmental sustainability is an integral, core principle of the bioeconomy and products developed must be sustainable. Feasibility assessments should include environmental and social feasibility. The amount of biomaterial extracted should not have a negative impact on our biological resources; it should not exceed the capacity of the environment to replenish itself; and should cause no lasting damage to an environment. This should be regarded from a holistic view, which takes all biomass into account, including that in the soil. Activity in the bioeconomy should not degrade resilience or biodiversity in the ecosystem.
- **Cascading Principle:** Whereby higher value applications are preferentially derived from biological resources (e.g., food, bio-based materials and chemicals) prior to their use in energy and fuel generation which will allow us to derive the maximum value from our bioresources.
- **Precautionary Principle**: Is a risk management approach to prevent policies or actions causing harm to the public or the environment. Innovation in the bioeconomy will depend on the sensible application of this principle and it should be informed by the latest scientific information and consensus.

- **Food First Principle**: Gives priority to food and nutrition security by improving the availability of and access to a safe and healthy food supply for citizens.

The Government's Strategic Policy Objectives for the Bioeconomy

- **Sustainable economy and society -** Growing the bioeconomy can put Ireland's economy on a more sustainable footing by encouraging the efficient use and re-use of resources and materials to a much greater extent than hitherto.
- **Decarbonisation of the economy -** The bioeconomy can play a part in lowering greenhouse gas emissions through, for example, the development of innovative practices and processes that can improve the efficiency in agriculture and forestry production systems. Bioprocessing and bio-refining can replace high embedded carbon products such as concrete, steel, plastics and chemicals with biobased alternatives and produce new products.
- **Jobs and competitiveness -** The bioeconomy can foster employment as many of the inputs for the bioeconomy are sourced nationally, so its development has a greater impact compared to other areas of the economy that are more reliant on imports. In this context, it is worth noting that as the agri-food and marine sector faces considerable uncertainties due to the prospect of Brexit, growing the bioeconomy represents an opportunity for this sector to diversify and reduce the risks confronting it.
- **Regional prosperity -** One of the advantages of the bioeconomy is that many of the businesses rooted in it are located in rural and coastal areas. Helping the bioeconomy to grow can assist in halting rural decline.

6.2 Governance Pillar

It is envisaged that the Governance pillar will address key issues which impact across all other Pillars such as networking, awareness raising and policy, sectoral and regulatory coherence. This Pillar will also address how we communicate the bioeconomy and its policies across various sectors, wider society and with stakeholders. It will seek to grapple

Question 2: Are there specific key performance indicators and/or targets the bioeconomy should be setting out to achieve to measure its implementation?

Question 3: What other key issues should the Governance Pillar deal with?

with issues such as how the Bioeconomy interacts with our legal, planning, and regulatory system, and how Government disseminates scientific expertise into policymaking decisions.

6.3 Research, Development & Innovation Pillar

Impact 2030, Ireland's Research and Innovation Strategy positions research and innovation at the heart of addressing Ireland's societal, economic and environmental challenges. Consistent with Impact 2030, this Pillar will outline actions to generating and advancing research, development and innovation in the bioeconomy including to enhance, apply and scale-up biological knowledge and bioeconomy solutions.

Research, development, and innovation have been a cornerstone of the Irish Bioeconomy policy development to date and will continue to be vital. This Pillar will seek to address how research, development and innovation can continue to be fostered in a collaborative and coherent way. Bioeconomy development by its very nature needs highly collaborative endeavours, requiring participation, expertise, and investment on the part of multiple actors including government, the private sector, and civil society. A key factor for success is achieving effective co-operation among these multiple, diverse participants. Bringing together multiple actors to make complementary investments raises challenges and requires appropriate approaches. This Pillar will link to the Industry & Enterprise Pillar and the Knowledge & Skills Pillar to ensure that funding pathways exist to move from research, development, and innovation to commercialisation, including how to best harness national and EU funding.

Question 4: What key issues should the Research, Development & Innovation Pillar deal with?

Question 5: How could the RD&I bioeconomy approach be best structured to support the enhancement, application and scaling-up of biological knowledge and bioeconomy solutions?

6.4 Nature, Climate & Circular Pillar

This pillar will develop actions to foster and protect our natural capital and biodiversity, including accounting for natural capital and ensuring the bioeconomy operates within ecological boundaries. It will seek to enable bioeconomy policies to optimise the societal benefit from terrestrial, aquatic and marine environments and their biological resources, including biodiversity, other ecosystem services and for climate action.

Bioeconomy is essential yet often not fully understood in climate change adaptation and mitigation policy and actions. A sustainable and circular bioeconomy offers a holistic approach for impact-focused, cross-sectoral climate policy, especially in achieving reduced carbon emissions, new sustainable and climate-resilient pathways for development, and mobilizing citizen participation in climate action.

This pillar will also address issues around by-products and end of waste, cascading use, valorisation, resource efficiency and sufficiency and consumption patterns, as well as how the bioeconomy will interact with the government's circular economy programmes.

It will also outline actions which will aim to ensure that renewable energy and the bioeconomy function harmoniously.

Question 6: What key issues should the Nature, Climate & Circular Pillar deal with?

Question 7: What key issues concerning consumption patterns need to be examined to close the gap between sustainable supply of biological resources and demand?

6.5 Agriculture, Food & the Marine Pillar

This pillar will support transformative actions relating to agriculture, horticulture, forestry, fisheries and aquaculture sectors and blue bioeconomy and for the sustainable production, supply and consumption/utilisation of biomass and ecosystem services.

The pillar will address actions concerning climate neutral and regenerative farming and landscapes supporting the legal requirement to achieve climate neutrality by 2050 and deliver negative emissions from that year on with carbon emissions significantly reduced and any remaining greenhouse gas (GHG) emissions balanced, and subsequently exceeded, by sequestration or removals. The Pillar will also support the establishment of sustainable value chains, innovation support services and networks for unlocking the full potential of primary and secondary bio-based feedstocks, through cascading and optimised valorisation of all the biomass components and the promotion and support of new types of bioeconomy business models through bioeconomy demonstration initiatives.

Question 8: What key issues should the Agriculture, Food & the Marine Pillar deal with?

6.6 Communities Pillar

Biological resources are distributed widely across rural, coastal, marine and regional areas. Additionally, cities and regions can also develop urban bioeconomy initiatives that focus on making bio-based products from urban biowaste and wastewater or developing the role of forests within urban areas. Therefore, local bioeconomies, if co-developed with the participation of higher education institutions, industry, communities, agencies, and regional and local government, have great potential to generate an equitable distribution of prosperity across a wider geography. This pillar will seek to operationalise a territorial approach to policymaking, demonstration, and implementation for the bioeconomy in specific territorial contexts seeking to combine universities-industry-government-public-environment interactions within a knowledge-based bioeconomy. This pillar would complement ongoing national operational activities.

Question 9: What key issues should the Communities Pillar deal with?

Question 10: Are local and regional policies ensuring the consideration of bioeconomy opportunities are in scope, and are coordinated approaches on such services in place at regional assembly and local authority level?

6.7 Industry & Enterprise Pillar

In Ireland, industry is responsible for 11.5% of all greenhouse gas emissions. It is urgent to transform industry to scale up resource-efficient, circular and bio-based solutions based on both renewable energy and sustainable biological resources. By supporting innovation, cascading principles, and implementing bioeconomy approaches, industry can significantly contribute to improving autonomy in terms of resource needs. Replacing fossil-based carbon with reused captured carbon or using bio-based alternatives could reduce import dependency. There is positive potential for the bioeconomy, both in terms of growth and climate impact in relation to nature and bio-based products through sink, storage and substitution potential. The legislative proposal on a European framework for the certification of carbon removals, which could lead to a market for carbon removals, may further incentivise measures and engagement by industry and enterprise to increase carbon sequestration and storage.

This pillar will include the coordination of actions affecting innovation performance including relating to entrepreneurship, innovation and the commercialisation of bio-based products,

processes, and services including carbon storage in biobased products. Issues which will be addressed under this pillar include removing barriers to technological advances and seeking to link with the Research, Development & Innovation Pillar insofar as it will aim to ensure that clear pathways exist for innovators to move from research and development to full commercialisation.

While encouraging new entrants and entrepreneurship remains an important aim of policies for the bioeconomy, it is also the case that the private sector might not step in because there is no developed market yet, or state agencies can provide lead market or educational, training or advisory roles.

Investment is also an essential tool to further progress Ireland's bioeconomy. This pillar will look to address the issue around access to finance for bioeconomy investment, taxation and links to co-alignment and coherence with circular economy and renewable energy approaches.

Question 11: What key issues should the Industry & Enterprise Pillar deal with?

Question 12: What lead market initiatives could support entrepreneurship, development, innovation and the commercialisation of bio-based products, processes, information, and services?

Question 13: Due to the requirement for capital and operational investment what innovations aimed at financing infrastructures and technical and economic evaluation of innovation are necessary to scale up the bioeconomy?

6.8 Knowledge & Skills Pillar

Impact 2030, Ireland's Research and Innovation Strategy recognises that talent is at the very heart of Ireland's research and innovation ecosystem and our future prosperity as a people. Likewise, to support our biobased industries, we need an educated and skilled workforce.

Question 14: What key issues should the Knowledge & Skills Pillar deal with?

Question 15: Can the regional skills and regional enterprise approaches better support bioeconomy development?

Question 16: An important part of developing the bioeconomy is to determine the most appropriate practices, treatments, technologies, logistics and business models to valorise ecosystem services, primary and secondary biomass resources. What role do advisory systems play in addressing this challenge?

Further action is needed in education, training, and upskilling, to ensure we have an appropriate workforce for the bioeconomy both now and in the future. We must also utilise our education system to boost understanding and awareness for the public, though collaboration with education facilities from primary and secondary education through to vocational and third level universities and advisory systems. This pillar will seek to address these issues with a lens on both the here and now, and the future.

6.9 Other Questions

Question 17: Are there any further Pillars/Issues which this Action Plan should address?

Question 18: Indicate what the top five priorities for action in the bioeconomy over the next three years should be?

Annex 1 Questions

1. Are you satisfied the outlined Pillars represent the structure of the Irish bioeconomy?
2. Are there specific key performance indicators and/or targets the bioeconomy should be setting out to achieve to measure its implementation?
3. What other key issues should the Governance Pillar deal with?
4. What key issues should the Research, Development & Innovation Pillar deal with?
5. How could the RD&I bioeconomy approach be best structured to support the enhancement, application and scaling-up of biological knowledge and bioeconomy solutions?
6. What key issues should the Nature, Climate & Circular Pillar deal with?
7. What key issues concerning consumption patterns need to be examined to close the gap between sustainable supply of biological resources and demand?
8. What key issues should the Agriculture, Food & the Marine Pillar deal with?
9. What key issues should the Communities Pillar deal with?
10. Are local and regional policies ensuring the consideration of bioeconomy opportunities are in scope, and are coordinated approaches on such services in place at regional assembly and local authority level?
11. What key issues should the Industry & Enterprise Pillar deal with?
12. What lead market initiatives could support entrepreneurship, development, innovation and the commercialisation of bio-based products, processes, information, and services?
13. Due to the requirement for capital and operational investment what innovations aimed at financing infrastructures and technical and economic evaluation of innovation are necessary to scale up the bioeconomy?
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17. Are there any further Pillars/Issues which this Action Plan should address?
18. Indicate what the top five priorities for action in the bioeconomy over the next three years should be?