Rialtas na hÉireann
Government of Ireland

BIOECONOMY ACTION PLAN 2023-2025

Prepared by the Department of the Environment, Climate and Communications and the Department of Agriculture, Food and the Marine.

www.gov.ie

BIOECONOMY ACTION PLAN 2023-2025
VERSION 2.0

CONTENTS

FOREWORD

FROM THE MINISTER FOR AGRICULTURE, FOOD AND THE MARINE

The bioeconomy is a new approach to utilising the products, services, wastes and side-streams from sectors such as agri-food, forestry, fisheries, and aquaculture more sustainably. It offers opportunities to reduce GHG emissions in the agri-food system by replacing fossil-based resources with biological ones, from biofertilisers and biopesticides, to new food sources, bio-plastics and textiles, and biological waste management, to name just a few. It is therefore a key element in our sector's transition to climate neutrality. Food Vision 2030 committed to embedding the agri-food sector in the circular, regenerative bioeconomy. It highlighted that the livestock, arable, marine and horticulture systems in particular should examine the use and circularity of raw materials from each other's supply chains and also waste flows from the food industry. It also sought to scale up circular and low carbon solutions based on principles of renewable energy, cascading and circular use of sustainable resources. I believe that this action plan will be pivotal to the delivery of those ambitions in Food Vision.

Great progress has been made in developing the bioeconomy since the publication of the National Policy Statement in 2018, particularly around coordination and governance, research, and awareness. Our ambition now is to build on this and further develop the Irish bioeconomy to support the achievement of a nature positive, climate neutral, innovative economy.

The action plan will provide an enhanced policy framework to support an improved coordinated approach across Government, seeking to increase the value-add of our bioeconomy in an ecologically, socially, and economically sustainable manner and to support making Ireland climate neutral by 2050. In line with Food Vision 2030 commitments, it will support the development of bioeconomy demonstration initiatives, the re-circulation and upcycling of bio-materials, and expand advisory support services. It will also bring the research and innovation advancements closer to the market, thus accelerating the transition from research to industrial biobased production.

The publication of this action plan coincides with the recent adoption by European Agriculture Ministers of a set of Council Conclusions on the bioeconomy. I was pleased to support these as they highlight the key role that the bioeconomy can play in achieving environmental and climate goals, while also improving competitiveness, helping us transition away from fossil-fuel dependency, and strengthening food security in the wake of Russia's war of aggression against Ukraine. The Conclusions provided further important guidance for the development of this action plan, thus ensuring that our way ahead is well aligned with developments in Europe.

For the agriculture, food, forest and marine sector, the bioeconomy offers a vast range of new opportunities, new business models, new value chains, and is a key element in the diversification of the sector. I have every confidence that this national action plan will help realise these exciting possibilities and I urge all stakeholders to mobilise behind its implementation.

Charlie McConalogue T.D.,
Minister for Agriculture, Food and the Marine

FOREWORD

FROM THE MINISTER FOR THE ENVIRONMENT, CLIMATE AND COMMUNICATIONS

Addressing the climate crisis is the most pressing, long-term, global challenge of our generation. Achieving the Paris Climate Agreement, halving emissions by the end of this decade and reaching net-zero by 2050, will require transformative change across all of economies and societies. This will demand a rethink of our current economic models for every sector. The bioeconomy offers us novel and sustainable opportunities in our industry, agriculture, marine, forestry, waste management, bioenergy, biobased chemicals and materials, and technology sectors.

The bioeconomy provides alternatives to non-renewable or fossil-based products, reducing emissions from high-emitting activities. Not only that, but the bioeconomy also offers us new and innovative markets to foster, capitalise on, and lead in internationally. For all of us, it offers more sustainable products such as biobased plastics, bioenergy, sustainable wood products, and biobased chemicals and materials.

The bioeconomy is a key component of our circular economy, aiding us in our transition to net-zero by shifting to sustainable patterns of production and consumption. Focusing on reducing the extraction of raw materials and increasing their longevity and value in our economy.

As the bioeconomy cuts across several sectors, it requires coordination and joined-up thinking between public bodies, research institutions, private industry, and the wider public. The Actions in this plan provide the framework for coordination while bolstering the bioeconomy through seven distinct pillars.

This action plan is Government's next step in realising Ireland's vision to be a global leader in the bioeconomy, by harbouring a coordinated approach, by harnessing our biological resources sustainably, and by optimising our competitive advantage.

The Bioeconomy Action Plan will enable the harnessing of our biological resources sustainably and optimise our competitive advantage. It will nurture our bioeconomy through to 2025, halfway through an important decade for climate action and the development of a sustainable food system. Beyond 2025, as we approach our 51% reduction target and a net-zero society, the bioeconomy will become increasingly vital for this transformative change across Ireland.

Eamon Ryan T.D.,
Minister for the Environment, Climate and Communications

EXECUTIVE SUMMARY

Bioeconomy Action Plan 2023-2025 is the first national action plan for an Irish bioeconomy. The purpose of this plan is to further develop Ireland's bioeconomy in delivering the vision of the 2018 National Policy Statement on the Bioeconomy; for Ireland "to be a global leader for the bioeconomy through a coordinated approach that harnesses Ireland's natural resources and competitive advantage and that fully exploits the opportunities available while monitoring and avoiding unintended consequences".

This action plan approaches the bioeconomy using seven pillars:

GOVERNANCE & AWARENESS sets out actions which will increase the understanding and awareness of the bioeconomy and enhance the coordination and coherence of policies in support of the bioeconomy.

RESEARCH, DEVELOPMENT & INNOVATION has been a critical policy implementation pillar to date and actions to support this by Government will continue. Bioeconomy opportunities will be integrated into national research funding programmes and support scaling-up through pilot and demonstration projects and knowledge transfer.

NATURE, CLIMATE, ENERGY & CIRCULAR ECONOMY is a key enabler in our transition to net-zero. This pillar seeks to support and develop the bioeconomy in tandem with the circular economy, with a core focus on sustainability, circularity, regenerative practices, and enhanced natural capital. This pillar will ensure that the development of bioenergy occurs in tandem with the successful deployment of other biobased solutions.

AGRICULTURE, FOOD, FORESTRY, AND THE MARINE is a key sector, in an Irish context, for biomass and biomaterial generation. This pillar has actions which will continue to develop bioeconomy demonstration initiatives, expand advisory support services, and support the re-circulation and upcycling of biobased materials.

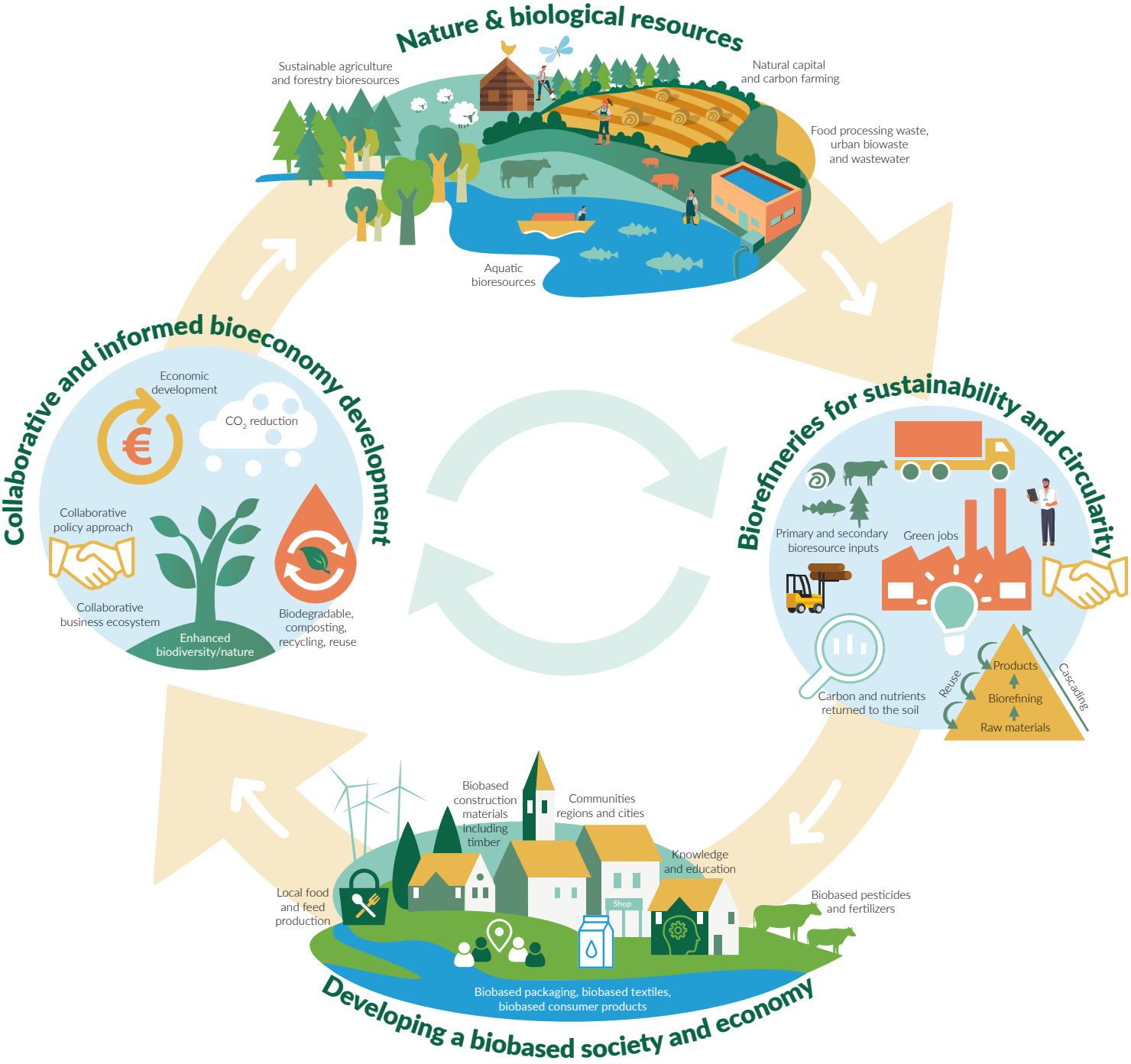
COMMUNITIES, REGIONS & CITIES sets out actions to support local and regional bioeconomies by enhancing governance approaches, harnessing existing funding opportunities, and boosting social and regional enterprises and skills.

INDUSTRY & ENTERPRISE action is required to move beyond piloting and demonstration to commercialisation. This pillar supports that transition, directing actors in the bioeconomy to supports that are available to them, encouraging biobased industries to assess and enhance their sustainability and circularity, and by developing a coordinated approach to investment in the bioeconomy.

KNOWLEDGE & SKILLS are essential for the bioeconomy to function and sustainably develop. This pillar will, at all levels of education, promote the bioeconomy and sets out actions to ensure that continuous learning and professional development in the bioeconomy is available.

The Action Plan is aligned with the implementation of the National Policy Statement on the Bioeconomy including its vision, guiding principles on sustainability, cascading use, a precautionary approach, a food-first priority, and the guiding principle for an area-based focus on sustainable development.

A SUSTAINABLE, CIRCULAR AND REGENERATIVE BIOECONOMY FOR IRELAND



IRELAND'S BIOECONOMY

The bioeconomy encompasses all sectors, associated services and investments that conserve, produce, regenerate, process, distribute or consume biological resources including related ecosystem services, knowledge, science, technology, and innovation. The bioeconomy is not restricted to using biobased renewable resources and feedstock for manufacturing and production; it also supports a transition to clean energy, establishing sustainable and circular food production and agricultural systems, plus resource conservation, optimisation and reuse during manufacturing and processing, amongst others enabling a transformation to a sustainable and circular economy.

A sustainable and circular bioeconomy will deliver strategic policy objectives including:

- boosting employment and new business opportunities in rural, regional, urban, and coastal areas, through new and innovative products, services, and technologies,
- increasing food and energy security,
- supporting climate action by displacing fossil fuels,
- promoting a circular economy and reducing waste,
- providing high-value diversification opportunities for transforming the agri-food system, and
- leveraging research, development, and innovation capabilities to address Ireland's bioeconomic, societal, and environmental challenges.

Developing our bioeconomy will also provide major opportunities for achieving the Sustainable Development Goals across all sectors and our society during the coming decade of transformative change as we seek to reduce emissions by 51% by 2030 and prepare for life at net-zero emissions by 2050.

NATIONAL POLICY STATEMENT ON THE BIOECONOMY

The National Policy Statement on the Bioeconomy[1] (2018) outlined Ireland's long-term vision and guiding principles for developing the bioeconomy. The policy statement provided an important policy signal to both national, EU and international stakeholders regarding Ireland's vision to capitalise on the potential of the bioeconomy in line with strategic objectives on sustainable development, climate action, circular economy, competitiveness, and rural and regional development.

> "The Government's vision for the bioeconomy is to grow Ireland's ambition to be a global leader for the bioeconomy through a coordinated 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 a target compliance and carbon mitigation focus 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.

[1] gov.ie - National Policy Statement on the Bioeconomy (www.gov.ie)

The National Policy Statement on the Bioeconomy remains the overarching policy approach for bioeconomy development in Ireland. The Bioeconomy Action Plan 2023-2025 has been developed to advance the implementation of the policy statement.

DEVELOPMENT OF AN ACTION PLAN

Since the publication of the National Policy Statement on the Bioeconomy in 2018, the High-Level Bioeconomy Implementation Group[2] (BIG) has reported to Government twice (2019[3], 2023[4]) on the progress achieved in implementing the policy statement and in supporting the delivery of the bioeconomy policy statement vision, guiding principles and its strategic objectives.

In the Climate Action Plan 2021, the Department of the Environment, Climate, and Communications (DECC), the Department of Agriculture, Food, and the Marine (DAFM) and the BIG committed to developing this detailed and tailored three-year Bioeconomy Action Plan with the aim being to further progress the Irish bioeconomy. To prepare for the action plan, the BIG extensively engaged with stakeholders including establishing a Bioeconomy Forum[5] and the Bioeconomy Network.[6] In particular, the forum brought together 33 members, one observer, and 17 scientific and technical advisors to report on the progress of bioeconomy development from the perspective of industry and community stakeholders and experts. This deep stakeholder engagement has provided a key input and evidence base for the generation of this action plan. Alongside the Climate Action Plans, the Bioeconomy Action Plan aims to compliment to National Biodiversity Action Plans and the River Basin Management Plan.

Additionally, the Circular Bioeconomy Outlook Study 2030-2050 in support of Climate Action, Sustainable Food and Biobased Systems[7] was conducted by the research community. This study provides an evidence synthesis, including a review of feedstocks, technologies, intellectual properties, policies, and best practices to guide and provide recommendations for the development of the action plan.

From an all-Island perspective, Ireland and Northern Ireland are faced with very similar climate and sustainability challenges, have similar agriculture, land use and marine activities, and stakeholders in these sectors have developed close cross-border collaborations over time. Indeed, some of the bioresources, such as fish, are clearly not confined within borders. Consequently, collaborating on this bioeconomy initiative north and south offers significant potential synergies, addressing those sustainability challenges while enhancing existing collaboration and fostering new partnerships in the spirit of a shared island.

The action plan is also cognisant of developments at EU and International level and in particular the adoption by the EU Commission of the bioeconomy strategy progress report. The action plan also considers the EU Council conclusions on the bioeconomy[8] and the developments by the Food and Agriculture Organisation of the United Nations of activities on sustainable and circular bioeconomy for food systems transformation (fao.org), climate action and biodiversity.

---

2 The Government through the National Policy Statement on the Bioeconomy has mandated an implementation group jointly chaired by the Departments of Agriculture, Food and Marine and the Environment, Climate and Communications to take forward several major actions, in close collaboration with bioeconomy industries and other partners.

3 https://www.gov.ie/pdf/?file=https://assets.gov.ie/93222/a3720661-c532-40f3-9dbd-f0bddb029a4e.pdf#page=1

4 https://assets.gov.ie/253613/ef977a8b-c2f0-468c-a24e-76c65f0f8ee1.pdf

5 gov.ie - First meeting of the National Bioeconomy Forum (www.gov.ie)

6 gov.ie - Stakeholder coordination & consultative groups (www.gov.ie)

7 Circular Bioeconomy Outlook Study 2030–2050 Evidence Synthesis Reports | Environmental Protection Agency (epa.ie)

8 Promoting a more sustainable, competitive, and resilient Europe and boosting rural areas: Council approves conclusions on the opportunities of the bioeconomy - Consilium (europa.eu)

A Public Consultation was also held from 24 November 2022 to 27 January 2023. In total 49 responses were received and considered as part of the development of this action plan.

MISSION

This action plan will further develop Ireland's bioeconomy, in environmental, economic, societal and policy terms, for the period 2023 to 2025. It will lead to increased awareness and understanding of the bioeconomy more broadly; to enhanced policy coordination and greater integration of the bioeconomy within sectoral policies; ensure support for the goal of moving biobased innovation and solutions from research to sustainable and circular industrial production with accelerated speed; support greater investment in demonstrating the bioeconomy, providing exemplars; and ensuring support for interactions and progress among multiple actors, including businesses, primary producers, scientific communities, policymakers, social movements, and interest groups.

GUIDING PRINCIPLES

The vision set out in the National Policy Statement is supported by guiding principles to help translate this vision into coordinated action. An additional guiding principle on area-based local and regional development has now been added, based on stakeholder feedback.

- **Sustainability:** environmental sustainability is an integral, core principle of the bioeconomy and products developed must be sustainable. Feasibility assessments should include both 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:** 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 enable all stakeholders (including biomass growers (farmers, foresters, fishing community, etc.), industry and consumers) to derive the maximum value to be derived from our bio-resources.
- **Precautionary:** 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:** gives priority to food and nutrition security by improving the availability of and access to a safe and healthy food supply for citizens.
- **Area-based local and regional development:** supporting integrated and multi-sectoral strategic approaches including networking, clustering, cooperation, initiatives, and partnerships to support the development of regenerative biobased innovation and solutions at local and regional levels to boost employment, business opportunities and community gains on the ground.

STRATEGIC APPROACH

This action plan recognises the holistic and cross-sectoral nature of the bioeconomy. It further elaborates on the policy implementation framework for the bioeconomy identified in the National Policy Statement on the Bioeconomy and recognises that for the bioeconomy to function as intended, it must balance its development between each of seven key pillars. These pillars are Governance & Awareness (1); Research, Development & Innovation (2); Nature, Climate, Energy & Circular Economy (3); Agriculture, Food, Forestry & the Marine (4); Communities, Regions & Cities (5); Industry & Enterprise (6); and Knowledge & Skills (7) (**see Figure 1**).

Figure 1: Bioeconomy policy implementation framework


ACTION PLAN


1
Governance
& Awareness

ACTIONS AT A GLANCE

- Increase awareness and understanding of the bioeconomy as a powerful climate action tool.
- Enhance governance of bioeconomy policy across Government.
- Assess how our regulatory system interacts with bioeconomy activities.
- Enhance our North/South, EU and international cooperation for the bioeconomy.
- Develop a National Bioeconomy Strategy.

The critical role of the bioeconomy is to reduce emissions, as part of the transition towards a net-zero society. The bioeconomy has climate action at its heart, this must be more widely recognised, understood, and communicated.

Sustainably sourced, produced and consumed, biobased products contribute to increased self-sufficiency while reducing our dependence on imported fossil fuels. There is a need for clear, coherent communication and outreach. A bioeconomy communication campaign will be developed providing clear messages to:

- bolster awareness and understanding of the economic, social, and environmental benefits of the bioeconomy,
- ensure stronger recognition of the bioeconomy as a key enabler of climate action, a circular economy, and a green and just transition,
- highlight the bioeconomy's potential to contribute to the Sustainable Development Goals, by equally considering environmental, social, and economic sustainability.

As mandated by the National Policy Statement on the Bioeconomy, policy will be managed by the High-Level Bioeconomy Implementation and Development Group (BIDG). This group and its role will be enhanced, to ensure a more coherent approach and greater integration of bioeconomy in the development and implementation of policy. The National Bioeconomy Forum and its Expert Advisory Group will also be reconvened for the period of the action plan to continue to feed into the policy making process. The BIDG will also report to Government regularly on the progress achieved in implementing this action plan.

Research will be undertaken to frame the progression and development of our bioeconomy by outlining the direct and indirect economic activity it produces, with a focus on regional, rural, spatial, and coastal development. Once this is captured, Government through the BIDG will work toward setting and achieving key performance indicators considering environmental, social, and economic sustainability, linked to developments in the INFORMBIO project[9] and by targeting and tracking key bioeconomy developments.

It is vital that we continually assess the appropriateness and functionality of our regulatory system. A review of our regulatory system will be conducted to understand how it can encourage and support the bioeconomy aiming to identify pathways to address barriers.

Ireland will also enhance its international collaboration within our bioeconomy on a North/South, EU wide and international basis. During the lifetime of the action plan, consideration will be given to the current reflections of further strategic development of the EU Bioeconomy Strategy in line with the EU Green Deal, as well as to building upon ongoing collaboration with the Department of Agriculture, Environment and Rural Affairs (DAERA) as policy-leads in Northern Ireland.

Overall, the development of the bioeconomy must be aligned with the established vision, guiding principles and strategic objectives of the bioeconomy as outlined in the National Policy Statement.

Finally, building on the actions contained herein, this plan will culminate with the development of a National Bioeconomy Strategy.

[9] InFormBio Project - for a sustainable and circular Irish bioeconomy

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
1.1	Facilitate increased public and stakeholder understanding and awareness of the bioeconomy and biobased innovation and solutions through undertaking a bioeconomy communications campaign	1.1.1 Develop a targeted communications campaign highlighting sectoral case studies to improve understanding of the bioeconomy for stakeholders	Q4 2023 (1st campaign), 2024-2025	• DAFM (Lead) • DECC • Bioeconomy Implementation and Development Group • Climate Communications Coordination Committee (D/Taoiseach)
		1.1.2 Showcase the benefits to consumers of switching to biobased products including highlighting current Irish businesses and brands that have successfully switched to the use of biobased materials	Q4 2023 (1st campaign), 2024-2025	• DAFM (Lead) • DECC • Bioeconomy Implementation and Development Group • Climate Communications Coordination Committee (D/Taoiseach)
		1.1.3 Highlight the deployment of sustainable bioeconomy solutions developed by research centres, regional clusters and research projects that support a just and green transition	Q4 2023 (1st campaign), 2024-2025	• DAFM (Lead) • DECC • Bioeconomy Implementation and Development Group • Climate Communications Coordination Committee (D/Taoiseach)
		1.1.4 Run Bioeconomy Ireland Week annually each October. Support the National Bioeconomy Summit	Q4 2023 (1st campaign), 2024-2025	• DAFM (Lead) • DECC • Bioeconomy Implementation and Development Group
		1.1.5 Support Irish participation in the BISC-E student bioeconomy challenge	Q4 2023 (1st campaign), 2024-2025	• DAFM (Lead) • DECC • Bioeconomy Implementation and Development Group
		1.1.6 Develop a standardisation element, to promote the role of standardisation and its potential to support the bioeconomy	2023-2025	• DETE (Lead) • NSAI
1.2	Ensure long-term commitment to bioeconomy policy development and implementation through enhanced policy coordination and sectoral coherence	1.2.1 Each department to outline how bioeconomy integration in relevant policies is being advanced including through implementation actions being undertaken by the department or by agencies under their aegis with regular reporting outlining progress made being provided to the BIDG	2023-2025	• Bioeconomy Implementation and Development Group – **Pillar 1:** DECC, DAFM, D/Taoiseach (Joint-Lead) – **Pillar 2:** DFHERIS, DAFM DECC – **Pillar 3:** DECC, DAFM – **Pillar 4:** DAFM, DECC – **Pillar 5:** DHLGH, DRCD, DAFM, DECC – **Pillar 6:** DETE, DAFM, DECC – **Pillar 7:** DED, DFHERIS, DAFM, DECC
		1.2.2 Develop a bioeconomy policymaking guidance document and ensure policymakers and agencies have increased access to bioeconomy expertise	2023-2025	• DECC (Lead) • DAFM

continued

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
1.3	Further develop the Irish Bioeconomy Forum and network to reflect the diversity of perspectives needed to represent the transition to a sustainable and circular bioeconomy	1.3.1 Renew the Irish Bioeconomy Forum for the period of the action plan	2023-2025	• DAFM (Lead) • DECC, DETE • Bioeconomy Implementation and Development Group • Bioeconomy Stakeholder Forum
		1.3.2 Develop an annual operational work programme for the forum	2023-2025	• DAFM (Lead) • DECC • Bioeconomy Stakeholder Forum
1.4	Support the development of a bioeconomy observatory for a sustainable and circular Irish bioeconomy	1.4.1 Leverage the knowledge outputs of the INFORMBIO project to provide the research basis for monitoring bioeconomy development	Q4 2025	• DAFM (Lead) • DECC, DETE • Teagasc, EPA, SEAI, NESC • CSO
		1.4.2 Measure and report on the Irish bioeconomy using economic indicators: output, value added, investments, employment and exports based on annual national accounts	Q4 2025	• DAFM (Lead) • DECC, DETE • Teagasc, EPA, SEAI, NESC, BIM, MI • CSO
		1.4.3 Develop indicators to measure the sustainable development of the bioeconomy encompassing environmental, social, and economic indicators	Q4 2025	• DAFM (Lead) • DECC, DETE • Teagasc, EPA, SEAI, NESC • CSO
1.5	Develop an enabling regulatory approach that ensures coherence for the bioeconomy across policy areas	1.5.1 Analyse and understand the regulatory system related to the bioeconomy in its current state identifying good practices and bottlenecks	Q2 2024	• DECC (Lead) • DAFM, DETE, DHLGH • EPA, SEAI, NESC, MI
		1.5.2 Examine the development of a structured decision-tree and fast-track approach for bioeconomy regulation ensuring adherence to the principles of the bioeconomy	Q2 2024	• DECC (Lead) • DAFM, DHLGH • EPA, SEAI, NESC, MI
1.6	Develop North/South, EU and international collaboration on the bioeconomy	1.6.1 Engage with Northern Ireland to co-develop Shared Island Initiative opportunities to promote and support an all-island bioeconomy	2023-2025	• DAFM (Lead) • DECC
		1.6.2 Engage with EU Member States to promote and support the development of an updated EU Bioeconomy Strategy	2023-2025	• DECC (Lead) • DAFM • European Bioeconomy Policy Forum
		1.6.3 Engage with the FAO and other international fora to support sustainable and circular bioeconomy in line with the Sustainable Development Goals, the Paris Agreement, multilateral environmental agreements, and trade agreements	2023-2025	• DAFM (Lead) • DECC • Teagasc (related to engagement with the International Bioeconomy Forum, International Advisory Council on Global Bioeconomy) • SEAI (related to engagement with IEA Bioenergy)
1.7	Development of a National Bioeconomy Strategy	1.7.1 Monitor and contribute to the updating of the EU Bioeconomy Strategy and develop a national bioeconomy strategy to reflect EU developments	Q4 2025	• DECC, DAFM (Joint-Lead) • Bioeconomy Implementation and Development Group


2
Research,
Development
& Innovation

ACTIONS AT A GLANCE

- Integrate bioeconomy topics into National Research Funding Programmes.
- Accelerate bioeconomy pilot and demonstration projects.
- Support National Bioeconomy Research Infrastructure and Irish engagement in EU Research Infrastructure.

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. This is a commitment reflected in the vision and ambition of Impact 2030: Ireland's Research and Innovation Strategy.

Research, development, and innovation have been a cornerstone of Irish bioeconomy policy development to date and will continue to be vital. To further enhance its role in national research calls, bioeconomy will be integrated with a range of national strategic research and innovation agendas, such as the recently published Impact 2030.[10]

Research and innovation calls will also be offered on an ongoing basis to develop research capacity, capability, and knowledge outputs with the aim to support the development of innovative biobased products, nature-based solutions, regional development, sustainability, and circularity.

Key issues which will be explored include the use of bioresources to reduce agriculture and land use GHG emissions; understanding the bioeconomy market and demand for high value biobased products; accelerating the blue bioeconomy; and developing synergies between bioenergy, land use, agri-food systems, and bioeconomy development.

Bioeconomy development by its very nature needs highly collaborative endeavours, requiring participation, expertise, and investment on the part of multiple actors including Government, academia, the private sector, and civil society. Bioeconomy piloting and demonstration will be supported to advance research, development, and innovation to enhance, apply and scale-up knowledge, biobased innovation, and bioeconomy solutions.

Consistent with Food Vision 2030, Climate Action Plan 2023, and the **National Smart Specialisation Strategy for Innovation and Impact 2030: Ireland's Research and Innovation Strategy,**[11] this pillar aims to position knowledge generation as an engine of bioeconomy development. National and EU investments in research support infrastructures and capacities represent the shortest and most cost-effective route for strengthening the development of the bioeconomy including by supporting Ireland's engagement in the European Research Infrastructure for Bioeconomy (IBISBA).[12]

[10] Pillar 1.2.5 of Impact 2030, has the following strategic objective: "Become an innovative, competitive and resilient agri-food sector and bioeconomy, driven by a dynamic knowledge exchange system, data, technology and talent.

[11] https://www.gov.ie/en/publication/27c78-impact-2030-irelands-new-research-and-innovation-strategy/

[12] Pillar 2.4 of Impact 2030 commits to advancing priority system needs and opportunities through a framework for future research infrastructural investment.

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
2.1	Develop a bioeconomy thematic area in Strategic Vision and/or Research and Innovation Agendas (SRIA)	2.1.1 Develop a Strategic Vision and/or Research and Innovation Agenda (SRIA) including bioeconomy as a thematic area	Q2 2024	• DAFM (Lead) • DECC, DFHERIS • Research funders including MI, EPA, SEAI, Teagasc, National Research Agency
2.2	Integrate bioeconomy topics into National Research Funding Programmes[13]	2.2.1 Integrate bioeconomy topics into relevant national funding opportunities on an annual basis	Annually 2023-2025	• DAFM (Lead) • DFHERIS, DETE (DTIF) • Other research funders MI, EPA, SEAI, Teagasc, National Research Agency • National Research Agency Research Centres • Relevant EI Technology Centres & Gateways • Innovation Supports e.g., EI, BIM, Udaras.
		2.2.2 Explore and promote funding opportunities for engagement in related standardisation activities	Annually 2023-2025	• DETE (Lead) • NSAI
2.3	Accelerate bioeconomy piloting and demonstration actions[14]	2.3.1 Support and promote the EU-funded Circular Biobased Europe Joint Undertaking	Annually 2023-2025	• DAFM (Lead) • DETE • InterTrade Ireland
		2.3.2 Develop support activity for Irish research, industry, and societal partners to coordinate proposals into national and EU funding calls for innovation actions including demonstration and flagship initiatives	Annually 2023-2025	• DAFM (Lead) • DECC (including for CBE JU, LIFE & EU Innovation Fund) • DFHERIS
		2.3.3 Continue to consider Bioeconomy capital projects, led by state-funded bodies, through relevant Rural Regeneration and Development Fund (RRDF) Calls	Annually 2023-2025	• DRCD (Lead)
2.4	Support National Bioeconomy Research Infrastructure and Irish engagement in EU Research Infrastructure (RI)	2.4.1 Strengthen national research-support infrastructures to improve the use of knowledge to support sustainable and circular use of biological resources	Q4 2024	• DAFM (Lead) • DFHERIS • National Research Agency • Higher Education Institutions concerning EU Research Infrastructure
		2.4.2 Undertake an audit of the capacity, capability, equipment, and infrastructure related to bioeconomy	Q4 2024	• DAFM (Lead)

[13] **Research and Innovation Actions** aim to establish new knowledge or to explore the feasibility of a new or improved technology, product, process, service, or solution. These may include basic and applied research, technology development and integration, testing, demonstration, and validation on a small-scale prototype, in a laboratory or simulated environment.

[14] **Pilot and Demonstration Action (IAs)** include activities of 'testing', 'demonstrating' and 'piloting' and aims at scaling up activities from prototype, in a (near to) operational environment, industrial or otherwise, to large-scale product validation and market replication.


3
Nature, Climate, Energy & Circular Economy

ACTIONS AT A GLANCE

- Promote the bioeconomy as a key enabler of reaching emission reduction targets for 2030 and 2050.
- Develop bioeconomy in tandem with the circular economy.
- Develop an agreed approach to Natural Capital Accounting.
- Ensure bioenergy production is consistent with the principles of the bioeconomy.

As outlined in Climate Action Plan 2023, a sustainable and circular bioeconomy offers a holistic approach to cross-sectoral climate policy. This can achieve reduced fossil carbon emissions, new pathways for land and marine use, while also providing a Just Transition through the creation of new jobs and income opportunities. The bioeconomy is a powerful, and essential component in climate adaptation and mitigation policy. Reflecting this, our bioeconomy will be integrated, in an enhanced manner, into the national Climate Action toolbox.

There is also a need to coherently align our circular economy and bioeconomy policies to ensure co-benefits, including public awareness and participation. Our circular economy, an alternative to today's 'take-make-waste' model, has been supported by the Circular Economy and Miscellaneous Provisions Act 2022 and the Whole of Government Circular Economy Strategy. The next phase in this process will seek to outline regulation to ensure the proper functioning of our circular economy and bioeconomy, with the aim for both to flourish, to use and reuse materials, to reduce waste and to support regenerative activities.

As part of this, DECC, DAFM and the EPA will ensure that the bioeconomy is considered as part of addressing issues around by-products and end of waste, cascading use, valorisation, resource efficiency and sufficiency and consumption patterns. A national review of the regulatory systems which categorise materials, including by-products and end-of-waste materials, will be conducted, with the aim to enable eco-design and the better use and reuse of biobased materials in our economy including in areas such as agriculture, forestry, construction, textiles, plastics and chemicals, consumer goods and circular processing and manufacturing.

To complement this, it is vital that Government capture the flow of materials in our economy. An analysis, which will map materials across their life cycle, quantifying resources, materials, and waste over the stages of extraction and importation, production, use, recovery, and end of life, will be conducted.

This pillar also seeks to foster and protect our natural capital and biodiversity by enabling bioeconomy policies to optimise the societal benefit from terrestrial, aquatic, and marine environments including their biological resources, for biodiversity, other ecosystem services and for climate action.

At this juncture it is important that we have full oversight of our natural capital baselines to fully ensure that our bioeconomy complements and does not negatively impact our natural resources. Natural capital accounting will help us achieve this, therefore frameworks for natural capital accounting aligned with the bioeconomy will be developed to help measure changes in the stocks and flows of natural capital at a variety of scales, for better management of nature and biodiversity[15].

[15] Managing healthy and resilient ecosystems in the bioeconomy - Publications Office of the EU (europa.eu)

The bioeconomy must have a central role in the emerging development of renewable energy. As outlined in the Climate Action Plan 2023, Government has committed to delivering up to 5.7 TWh of indigenously produced biomethane, based on agricultural feedstocks. This will provide both an income diversification opportunity for farmers and a land-use alternative to livestock production. This will be supported by a National Biomethane Strategy, currently being developed by DAFM in partnership with DECC to identify the necessary actions to deliver on this ambition.

The production of this biomethane is a valuable component of a functioning bioeconomy. However, a key principle of any bioeconomy is cascading use, whereby higher value products should be extracted from a feedstock first before lower value products such as bioenergy. This will ensure higher, and more resilient, farm incomes. It is vital that agri-led biomethane expansion is developed alongside the sustainable development of the bioeconomy and its key enabling technology biorefining, with the potential for co-location and the production of multiple biobased products being a key consideration.

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
3.1	Promote the bioeconomy as a key tool to deliver on our emissions reduction targets for 2030 and 2050	3.1.1 Support the application of biological resources for: high-value innovative applications; uses which have no renewable alternative and are beneficial for the environment and climate; applications by which renewable carbon is stored; and support the development of climate neutral approaches to farm, marine and land management	Annually 2023-2025	• DECC (Lead) • DAFM, DETE, DFA, D/Taoiseach • EI, Teagasc, EPA, SEAI, MI
		3.1.2 Integrate bioeconomy into Ireland's engagement in international climate action and its cross-sectoral nature makes it a gamechanger in further COP deliberations	Ongoing	• DECC (Lead) • DFA
		3.1.3 Ensure bioeconomy development is considered in modelling, foresight, and scenario planning to resolve multiple pressures on land and sea for mitigation, nature protection and supply of biomass for food systems and the bioeconomy[16]	Ongoing	• DECC (Lead) (in the context of the Land-Use Review[17])

continued

[16] An integrated bioeconomy land use assessment is an action in the Communication on Sustainable Carbon Cycles. See Funding & tenders (europa.eu) See Funding & tenders (europa.eu) - HORIZON-CL6-2023-GOVERNANCE-01-7.

[17] gov.ie - Land Use Review – Phase 1 (www.gov.ie)

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
3.2	Ensure the bioeconomy contributes to the circular economy, including the development of regenerative practices and utilisation of organic side and waste streams from agriculture, forestry, fishery, food and feed, and organic process waste, and returning biodegradable products to the organic and nutrient cycle	3.2.1 Develop a roadmap for biowaste valorisation with industry, primary producers, public authorities, and stakeholders	Q4 2024	• DECC (Lead) • DAFM • EPA, SEAI, Teagasc, BIM • Regional Waste Authorities
		3.2.2a Examine national waste regulations, including those on by-product and end-of-waste decisions and guidance, and assess if they are effective for residual biowaste flows to be successfully managed for use in the bioeconomy	2023-2025	• DECC (Lead) • Regional Waste Authorities
		3.2.2b Ensure greater sectoral and multi-sectoral coherence within the bioeconomy through the development of risk assessment and management protocols regarding the use of by-products, which encourages the piloting of opportunities		
		3.2.3 Undertake a material flow analysis to support our transition to a sustainable and circular bioeconomy including analysing the projected 'biomass gap' between supply and demand for food, biobased materials, and energy and to understand the overall consumption of biological resources to help shift to more sustainable consumption patterns	Q4 2023	• DECC (Lead) • EPA • Other stakeholders who may provide analysis and statistics as appropriate
3.3	Apply the natural capital concept to bioeconomy development to secure the bioeconomy's environmentally and ecologically sound objectives	3.3.1 Develop natural capital approach to policy development leading to the establishment of accounting frameworks and baselines to measure changes in the stocks and flows of natural capital at a variety of scales, for better management of nature and biodiversity and to aid the development of a sustainable and circular bioeconomy	Q4 2024	• DECC (Lead) • DHLGH • NESC, EPA, Teagasc, NPWS • Natural Capital Ireland • Other stakeholders who may provide analysis and statistics as appropriate
3.4	Ensure a consistent approach which strikes a balance between bioenergy production and the development of our bioeconomy	3.4.1 Ensure bioeconomy principles and biobased innovation opportunities are considered in the development of the National Biomethane Strategy to be delivered in 2023	Q3 2023	• DAFM (Lead) • DECC, DETE • SEAI, EPA, Teagasc
3.5	Ensure a consistent approach across sectoral obligations for supply of renewable energy and the development of our bioeconomy	3.5.1 Ensure bioeconomy principles are considered in the ongoing development and implementation of supply side obligations toward an increase in the share of renewable energy consumption across end-use sectors	Q4 2023	• DECC (Lead) • D/Transport


4
Agriculture,
Food, Forestry
& the Marine

ACTIONS AT A GLANCE

- Develop bioeconomy demonstration initiatives.
- Develop bioeconomy innovation support services.
- Support re-circulation of by-products and their upcycling.

As outlined in Food Vision 2030, a key goal of Government is to 'Embed the Agri-Food Sector in the Circular, Regenerative Bioeconomy'. This will be based on a process of searching, experimenting, reflecting, and learning that is considered necessary to support the emergence of sustainable practices, technologies, products, and market development. This process must be supported with actions aimed at enabling innovation, experimentation, diffusion, cooperation, and networking in specific contexts.

To address this need, the actions in this pillar seek to develop regenerative, transformative bioeconomy demonstration initiatives relating to agriculture, horticulture, forestry, fisheries, and aquaculture that supports a food and biobased system that is good for people, farmers, nature, and business.

These initiatives aim to ensure low impact, diverse and sustainable production, supply, consumption and utilisation of biomass and ecosystem services. These will focus on biobased feedstock and processing, biobased products and their market development, and cross-cutting issues including communication, environmental sustainability, and financial supports.

Knowledge and innovation play a crucial role in helping farmers, foresters, fishers, and rural communities meet current and future challenges. To ensure that bioeconomy knowledge is shared between everyone who uses and produces it, and that people are connected, effective Agriculture Knowledge and Innovation Systems (AKIS) are needed. These actions seek to develop innovation support services focused on the deployment of biobased business models across all biobased sectors.

These innovation support services will support the establishment of sustainable value chains through the development of cooperation approaches aligning natural capital, primary production and circular bioeconomy value chains and the development of cooperative business models.

Additionally, as the production of agri-biomethane has emerged as a climate action for the agriculture sector, actions in this area will be co-established with bioeconomy progression to ensure that biobased products are co-developed as part of this expansion.

Food loss and waste is also a significant challenge domestically.[18] This challenge can be turned to opportunity considering the potential to harness value from the circulation of food by-products through upcycling into new high-value ingredients and biobased products. With a third of food being lost or wasted, circulation and upcycling innovations provide opportunities not only to avoid sending food and by-products to landfill, but also to generate economic opportunities for farmers, fishers, and food businesses alike based on unavoidable waste.

A key factor for success is capacity and capability building while achieving effective co-operation among multiple diverse participants. The development of Project Development Assistance can facilitate the addressing of technical as well as non-technical barriers for scaling-up projects towards commercialisation.

[18] Food Loss and Waste | Environmental Protection Agency (epa.ie)

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
4.1	Develop bioeconomy demonstration initiatives	4.1.1 Issue calls for proposals to establish bioeconomy demonstration initiatives which ensure engagement with local communities including primary producers and enterprises to co-design and co-create new opportunities	Annually 2023-2025	• DAFM (Lead) (Innovation funding sources including e.g., CAP EIP-AGRI, EMFAF) » Sustainable land and marine-based crops for protein and biobased products (DAFM, Teagasc, EI, BIM, MI) » High Value products from harvested wood and forestry/forest processing residues (DAFM, EI, Forest Industries Ireland, CoFoRD Council, Coillte) • D/Taoiseach – Shared Island • DECC – CAF, Just Transition • DPER – NDP, NRRF, ERDF, Carbon Tax • DECC – Urban biowaste including sewage sludge (from wastewater) and Uisce Éireann (supported by DHLGH)
4.2	Develop bioeconomy innovation support services to support sustainable biomass production and uptake of biobased solutions and innovation	4.2.1 Integrate bioeconomy advisory services within the: • EI and IDA supports • Teagasc Climate Action Programme • EPA advisory activities on climate and circular economy • BIM and Marine Institute on blue bioeconomy • SEAI on bioenergy and biobased products	Q4 2025	• DAFM (Lead) • DETE, DECC • Teagasc, EPA, BIM, Marine Institute, SEAI • SBCI, NTMA (on finance)
		4.2.2 Develop project development assistance for bioeconomy developments initially aligned with agri-centric biomethane development	Q4 2025	• DAFM (Lead) • DECC
4.3	Support re-circulation of by-products and their upcycling into new high-value ingredients	4.3.1 Develop initiatives to support recirculation and biowaste upcycling activity by converting unavoidable waste flows from food and beverage manufacturing into value added products, through marketing solutions and/or biorefining and valorisation where commercially viable	Q4 2024	• DAFM (Lead) • DETE, DECC • EPA, Teagasc, EI, BIM, MI


5
Communities,
Regions
& Cities

ACTIONS AT A GLANCE

- ➜ Advance bioeconomy governance across communities, regions, and cities.
- ➜ Boost regional enterprises and skills for the bioeconomy.
- ➜ Utilize ERDF and LEADER funding to support regional and local sustainable and circular bioeconomy development.

Biological resources are distributed widely across rural, coastal, local, and regional areas. Additionally, large towns and cities also accumulate or can act as a repository of bioresources.[19] Therefore, it is necessary to consider developing urban and regional bioeconomy initiatives which focus on making biobased products from urban biowaste and sewage sludge (from wastewater) or developing the role of woodland and forests within urban areas.[20, 21]

To date bioeconomy policy development has largely been considered from a central and regional Government perspective[22] including being considered under the National Planning Framework but has not been systematically considered at a strategic level in cities, local authorities and in local development. Urban, regional, and local bioeconomies, if co-created and co-developed with the participation of higher education institutions, industry, communities, agencies, and regional and local Government, have great potential to aid the development of the bioeconomy. In doing so, they can facilitate the generation of an equitable distribution of prosperity based on ecosystem services, biobased products, and services across a wider geography.

The National Planning Framework, Local Economic, Enterprise and Climate Action Plans, and the Regional Enterprise and Regional Skills Planning system, offer a key opportunity to engage with stakeholders and to develop bioeconomy pathways from local bioresources through to industrial biobased products to aid the greening of industrial value chains, including by leveraging bioeconomy cluster development.

Engagement with the developments in the Just Transition Fund Territory, the Shannon Estuary Region and its taskforce, and other corridors of development offers the opportunity to consider the development of exemplar bioeconomy development aligned with renewable energy sources and the greening of food system and industrial value chains.

19 Ten key ideas for Biocities.pdf (efi.int)
20 Biocities Facility | European Forest Institute (efi.int)
21 Pathways for transition to Biocities.pdf (efi.int)
22 The bioeconomy has the potential to support regional development objectives and climate targets | Northern and Western Regional Assembly (nwra.ie)

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
5.1	Advance bioeconomy governance in cities, regional assemblies, Local Authorities	5.1.1 Integrate bioeconomy policy development into the national planning framework, city, regional assembly, local authority, and partnerships in the context of addressing climate action, green economy, enterprise, and economic development	Q4 2023	• DHLGH (Lead) • NWRA, SRA, EMRA • CCMA, LGMA, Local Authorities • Climate Action Regional Offices (CAROs)
		5.1.2 Host Rural Ideas Fora on the bioeconomy to boost understanding and awareness	Q3 2024	• DRCD (Lead) • DECC, DAFM
5.2	Co-create needs driven regional and local bioeconomy development linked to regional enterprise and regional skills	5.2.1 Develop bioeconomy pathways from bioresources through to industrial biobased products through regional enterprise and skills planning activities and to aid the greening of industrial value chains and local areas	Q4 2025	• DAFM (Lead) • NWRA, SRA, EMRA • LGMA, Local Authorities, • Regional Enterprise Plans (DETE), Regional Skills Plans (DFEHRIS) • CAROs
		5.2.2 Integrate bioeconomy into climate action planning and training being offered at local Government level	Q4 2025	• DECC (Lead)
5.3	Exploit European Regional Development Fund (ERDF) and LEADER funding to support regional and local sustainable and circular bioeconomy development	5.3.1 Seek exchequer funding to support EU co-funding opportunities through ERDF including for the Regional Innovation Valley for Bioeconomy and Food Systems opportunities.	2023-2025	• DAFM (Lead) • Regional Assemblies
		5.3.2 Facilitate capacity building sessions for Local Action Groups (LAGs) in relation to the bioeconomy	2023-2025	• DRCD (Lead)
		5.3.3 Encourage Local Action Groups to develop opportunities for funding for eligible projects available through the LEADER 2023-2027 funding programme where part of their approved Local Development Strategy	2023-2025	• DRCD (Lead)


6
Industry &
Enterprise

ACTIONS AT A GLANCE

- ➜ Leverage innovation supports and structures to support the development of the bioeconomy.
- ➜ Encourage biobased industries to undertake life-cycle analyses.
- ➜ Develop a coordinated approach to bioeconomy investment.

Transforming our industries to scale up resource and energy efficient, circular, and biobased solutions can address the emissions challenge for this sector.

This will improve resource and energy efficiency and autonomy in terms of zero-waste processing of bioresources. It will also contribute to developing a new innovative range of high value biobased products allowing for the replacement of fossil-based carbon with renewable biobased alternatives.

To enable this transition, there is a need for Government to communicate the supports which are available for biobased industries and enterprises for innovation and investment. These supports exist and are available to industry and enterprises that are looking to create bioeconomy opportunities while decarbonising themselves in the process.

The actions contained within this pillar seek to coordinate innovation performance relating to entrepreneurship, innovation and commercialisation of biobased products, processes, and services.

These actions aim at removing barriers to technological and non-technological advances, linking with actions in the Research, Development and Innovation Pillar to ensure that clear pathways exist for innovators to move from research and development to full commercialisation in an accelerated manner.

Additionally, biomass quality schemes, certification, product labelling and standards development[23] are demand oriented measures which should be considered to support product and market development, and as critical factors in ensuring transparency and traceability.

As referenced in the Nature, Climate and Circular Pillar, it is vital that the full potential of the bioeconomy is considered alongside the expansion of biomethane and other forms of renewable energy to ensure the long-term viability of the sector and to ensure its alignment with the principles of the bioeconomy.

Additional biobased innovation opportunities for industry through biorefining will be explored alongside the development of Anaerobic Digestion (AD) and biomethane plants to ensure that biobased options are developed commercially. In this respect, it is vital that biobased businesses assess their use of biobased resources adequately. The positive and negative impacts on natural capital need full consideration, as well as the capacity for natural capital to replenish and for the bioeconomy to be regenerative. It will be necessary to work towards ensuring holistic life cycle and social assessments are built into biobased business planning, including piloting and demonstration initiatives and large-scale commercial investments.[24]

[23] Standards for biobased products: new infographic developed by NEN - CEN-CENELEC (cencenelec.eu)
[24] Assessing environmental impacts | Knowledge for policy (europa.eu)

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
6.1	Support the development of the bioeconomy	6.1.1 Facilitate opportunities for new high added value biobased products and ensure that enterprise, industrial and research policy support the goal of moving from research to industrial production with accelerated speed	2023-2025	• DETE (Lead) • DECC, D/Transport • Enterprise Ireland, IDA Ireland, InterTrade Ireland, SEAI, NSAI • Regional Enterprise Plans
		6.1.2 Analyse the status and possibilities of bioeconomy and biobased materials as a strategic capability particularly in relation to all-island economic development, and as a climate transition pathway for all relevant industrial ecosystems	2023-2025	• DETE (Lead) • EI, IDA Ireland, InterTrade Ireland
		6.1.3 Generate demand for biobased products and biobased materials by encouraging use and awareness raising of biobased products through green public procurement	2023-2025	• DECC (Lead)
		6.1.4 Where new high added value biobased products are identified which are not standardised, explore the possibility of the European standardisation route	2023-2025	• DETE (Lead) • NSAI
6.2	Leverage existing innovation supports and structures in place to translate valuable outputs and intellectual property (IP) from research producing organisations, technological universities and universities to industry and society	6.2.1 Promote funding opportunities available for individual companies to work with research and cluster groups to invest in bioeconomy projects involving multiple actors and across sectors	Ongoing	• DETE (Lead) • DAFM • EI, BIM
		6.2.2 Continue support offered to bioeconomy enterprises to maximise the potential for commercialisation of research through the Innovation Offices of Higher Education Institutions (HEIs) and Technological Universities through the application of the ERDF Knowledge Transfer programme	Ongoing	• DETE (Lead) • EI • National Research Agency
6.3	Encourage and support biobased industries to undertake lifecycle analyses	6.3.1 Encourage (via Government bodies) and support (via Government funded agencies', research groups and infrastructures), biobased companies to carry out impact assessment modelling, for example lifecycle and social assessment analysis (LCSA), that will help to demonstrate the net positive impact of biobased products and services	Ongoing	• DAFM (Lead) • DECC • DETE • Teagasc, Enterprise Ireland, EPA, BIM

continued

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
6.4	Enhance existing innovation supports and structures in place to translate valuable outputs and intellectual property (IP) from research producing organisations, technological universities and universities to industry and society	6.4.1 Seed and scale-up competitive funding available for individual companies to work with research and cluster groups to invest in bioeconomy projects involving multiple actors and across sectors	Ongoing	• DETE (Lead) • DAFM • EI, BIM, InterTrade Ireland
		6.4.2 Examine a coordinated approach via research centres, gateways and clusters and include tools such as innovation sprints, acceleration, and access to scale-up funding and finance	Ongoing	• DETE (Lead)
6.5	Develop a coordinated approach to bioeconomy investment to support bioeconomy industrial development in a faster timeframe	6.5.1 Develop an understanding of the baseline level of national bioeconomy state investment to date for bioeconomy, and examine policy, regulatory and funding requirements to support bioeconomy industrial development	Q4 2024	• DAFM (Lead) • DECC, DETE • NTMA • Bioeconomy Implementation and Development Group
		6.5.2 Examine various investment models and structures, including blended finance, targeted and time-bound taxation expenditures, and Public Private Partnerships (PPPs), to co-fund the development of an Irish bioeconomy, initially aligned with agri-biomethane development, at varying scales, in line with the forthcoming National Biomethane Strategy	Ongoing	• DAFM (Lead) • NTMA
		6.5.3 The Department of Finance will include the bioeconomy in its climate and sustainable finance work – including taking it into account in financial services, multilateral development financing and fiscal policymaking, as appropriate	Ongoing	• DFIN (Lead)

7

Knowledge & Skills

ACTIONS AT A GLANCE

- ➜ Promote the bioeconomy in primary, second level, further and higher-level education where appropriate.
- ➜ Develop bioeconomy advisory services and continuous professional development programmes.

To support our biobased industries, we need an educated and skilled workforce and to create a career path for bioeconomy professionals in Ireland.

Impact 2030, Ireland's research and innovation strategy recognises that knowledge and talent is at the very heart of Ireland's research and innovation ecosystem and our future prosperity. Ireland's National Smart Specialisation Strategy for Innovation 2022-2027 (S3)[25] identified bioeconomy as a key and emerging strength in all three regions. Creating the skilled workers for the bioeconomy we need is an integral part of this strategy.

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.

To achieve this, our primary, post-primary and third level education systems can assist to increase understanding, interest, and awareness of the bioeconomy at a young age. Collaboration on curricula development from primary and post-primary school education through to further and higher education and advisory systems is required.

There is a need to engage with primary and post-primary schools to raise awareness and understanding of the bioeconomy and its cross-sectoral and system-wide impacts, in line with wider objectives of our second national strategy on Education for Sustainable Development (ESD to 2030).

Additionally, the bioeconomy will be promoted in primary and post-primary schools through awareness campaigns, including during the annual Bioeconomy Ireland Week.

The further and higher education sector can also play a key role in boosting knowledge and skills on the bioeconomy including through systems thinking and research-led teaching and learning approaches particularly considering the EU Commission study to explore the development of bioeconomy educational and training content.[26] The Further and Higher Education Institutes will be invited to consider how their education and university courses will reflect bioeconomy development at a policy and industry level, while respecting their autonomy for administrative and academic affairs.

The National Strategy on Education for Sustainable Development in Ireland (ESD to 2030) also includes an action for higher education institutions to progress the development of micro-credentials on ESD related topics, such as biodiversity and bioeconomy, to support upskilling and reskilling for a sustainable economy and society.

There is also demand for primary producers, agricultural, forestry and enterprise advisors, Local Action Groups and LEADER project development officers and other cooperation-facilitators and innovation intermediaries to receive awareness-raising training on the bioeconomy.

Overall, the BIDG will consult with the Expert Group on Future Skill Needs to identify the skills gap that needs to be addressed to adequately harness the full potential of both the circular economy and bioeconomy, including in areas such as continuous professional development.

[25] The smart specialisation (S3) approach offers a reinforced environment for increasing the interaction and cooperation among the different innovation ecosystems stakeholders, both at local, regional, national and international levels.

[26] Promoting bioeconomy education in Europe (europa.eu)

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
7.1	Promote the bioeconomy in primary education through integration into the new primary curriculum framework	7.1.1 Leverage the knowledge outputs from the EU-funded BioBeo project to support integration of the bioeconomy in the new primary curriculum framework	Q4 2024	• DED (Lead) • NCCA • DECC, DAFM • UCD – Leveraging the EU-funded BioBeo project
		7.1.2 As revised curricula and their specifications are developed from early childhood to senior cycle opportunities and linkages to ESD and the bioeconomy within the NCCA's Subject Development Groups will be explored, as considered appropriate	Q4 2025	• DED (Lead) • NCCA • DECC, DAFM
7.2	Update the second level junior and senior cycle curriculum to include the bioeconomy where appropriate	7.2.1 Explore the integration of the concept of bioeconomy in line with the redevelopment of the Senior Cycle, across a range of relevant learning experiences in subjects and modules, where appropriate	Q4 2024	• DED (Lead) • NCCA • DECC, DAFM
		7.2.2 Leverage the knowledge outputs from the EU-funded Leveraging education to boost EU bioeconomy's potential (biobec.eu), IKC3, and BioBeo projects for the second level curriculum	Q4 2024	• DED (Lead) • NCCA • DECC, DAFM • MTU – Leveraging the EU-funded Biobec project and IKC3 • UCD – Leveraging the EU-funded BioBeo project
		7.2.3 Coordinate with the second national strategy on Education for Sustainable Development to explore for programmes and competitions (e.g., Young Scientist) to promote and support consideration of the bioeconomy within these activities	Q4 2024	• DED (Lead) • NCCA • DECC, DAFM
7.3	Review and update relevant further and higher education programmes, to ensure that courses refer to and include bioeconomy where appropriate	7.3.1 Identify where bioeconomy education, training and skill gaps currently exist and how that might be remedied *7.3.1.1 Evaluate and adapt current programmes and models of delivery to enable current education, training, and skills programmes to effectively address the needs of the bioeconomy* *7.3.1.2 Consider new technologies and practices to enable soft skills and to develop multi-and inter-disciplinary understanding and communication between core disciplines related to the bioeconomy*	Q4 2024	• Higher Education Institutions • Education and Training Boards • Apprenticeship training providers and apprenticeship consortia • Teagasc Education

continued

NO.	ACTION	STEPS TO DELIVERY	TIMEFRAME	RESPONSIBLE
7.3 (cont'd)		7.3.1.3 *Develop the ability to understand and communicate with other STEM and non-STEM disciplines that occupy roles within the bioeconomy and are all vital to enable co-operation*		
		7.3.1.4 *Consider the need to develop bioeconomy education and training within apprenticeships, micro-credential courses that include bioeconomy in scope and support graduate conversion, upskilling in enterprise, multi- and trans-disciplinarity*		
		7.3.2 Leverage the knowledge outputs from the EU-funded leveraging education to boost EU bioeconomy's potential (biobec.eu) project and IKC3 for consideration by the further and higher education system	Q4 2024	• DFHERIS (Lead)
7.4	Support upskilling and reskilling for the bioeconomy	7.4.1 Provide opportunities for re-skilling and upskilling for the bioeconomy via funding calls for Springboard + programmes and HCI Pillar 1	Q4 2024	• Higher Education Authority
		7.4.2 Disseminate the outputs from the BioBEC project to relevant Irish stakeholders such as the regional skills fora and further and higher educational institutions when available	Q4 2024	• Higher Education Authority
7.5	Develop Bioeconomy Advisory Services and Continuous Professional Development Programmes	7.5.1 Embed bioeconomy into farm, forestry, marine, cooperative, and industry advisory services including integration of bioeconomy within the Teagasc Signpost Programme	Q4 2024	• DAFM, DETE (Joint-Lead) • Teagasc KT and Advisory • ICOS, BIM, Enterprise Ireland
		7.5.2 Develop CPD programmes to support bioeconomy development	Q4 2024	• DAFM, DETE (Joint-Lead) • Teagasc KT and Advisory • ICOS, BIM, Enterprise Ireland, Skillnet Ireland
7.6	Consult with the Expert Group on Future Skill Group – Skills (skillsireland.ie)	7.6.1 Examine the proposal of analysing and identifying skills gap for the circular economy and bioeconomy	Q4 2024	• DECC (Lead) • DAFM

MONITORING, IMPLEMENTATION AND DEVELOPMENT

The success of this action plan will depend on effective implementation and oversight.

A revised terms of reference will be established for the Bioeconomy Implementation Group, which will become a new High Level Bioeconomy Implementation and Development Group (BIDG) to support the implementation of the action plan.

The group will meet quarterly to ensure delivery on priority actions and to monitor progress across the action plan. The group will also meet and take submissions from stakeholders, as required.

The membership of the group will be as follows and will be reviewed on an ongoing basis to ensure that it is fit for purpose.

CO-CHAIRS

- Department of the Environment, Climate and Communications
- Department of Agriculture, Food, and the Marine

DEPARTMENTS/AGENCIES

- Taoiseach
- Enterprise, Trade and Employment
- Rural and Community Development
- Further Higher Education, Research, Innovation and Science
- Housing, Local Government and Heritage
- Transport
- Finance
- Education
- Public Expenditure, NDP Delivery and Reform
- Teagasc
- Marine Institute
- EPA
- Enterprise Ireland
- Science Foundation Ireland
- Sustainable Energy Authority of Ireland
- Bord Iascaigh Mhara
- National Economic and Social Council

The Implementation and Development Group will report back to Government each year in line with supporting governance approaches for accountability, transparency, and fairness in balancing the delivery of the bioeconomy vison, guiding principles and strategic objectives.

In carrying out these tasks, the group will also continue to work with the bioeconomy forum and the wider bioeconomy network liaising with relevant stakeholders within and beyond the bioeconomy.

Rialtas na hÉireann
Government of Ireland

www.gov.ie