

Sugarcane Bioenergy Inquiry 2025

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16 October 2025

Re: Queensland Parliamentary inquiry into sugarcane bioenergy opportunities in Queensland

Dear Parliamentary Committee Members,

Thank you for the opportunity to provide a submission to the Parliamentary Inquiry into Sugarcane Bioenergy Opportunities in Queensland.

The Centre for Agriculture and the Bioeconomy at Queensland University of Technology (QUT) is a leading provider of research and development for the Australian sugar industry and is globally recognised for its bioenergy research. QUT partners with Sugar Research Ltd to provide consulting services in Australia and internationally that are accelerating commercial implementation of sugarcane bioenergy. Through education and research training, QUT is developing the next generation of engineers, scientists, and researchers to support the growth of the Queensland sugarcane bioenergy industry.

QUT has recently released a report entitled Growing Australia's Bioeconomy – Building a Sustainable Economic Future. This report has identified opportunities for Australia in growing new bioenergy and bioproduct industries and will provide an important reference source for the committee. A copy of the report is **attached** to this submission.

In late September 2025, QUT launched the upgraded QUT Pioneer BioPilot facility which is located at the Racecourse Sugar Mill in Mackay, Queensland. This facility supports the sugar industry to develop and demonstrate new bioenergy and bioproduct technologies to support revenue diversification and growth of the industry. Facilities such as this are critically important to create a long-term, profitable, diversified future for the industry.

This submission addresses several important aspects of the Inquiry's terms of reference.

The role and benefits of sugar factory cogeneration in Queensland's electricity generation mix, including existing capacity and potential for expansion.

Increasing demands for energy, reducing stocks of fossil fuels, and concerns about global warming have made biomass an increasingly important source of energy for heating and electricity generation. Bagasse, the residue from the sugarcane processing process, is a significant biomass resource. Furthermore, sugar milling operations already have the infrastructure for harvesting and processing sugarcane and generating electricity from the bagasse produced. Sugar factories export base load power to the grid that displaces electricity generation by fossil fuels and therefore mitigates global warming.

During crushing operations, electricity export from the sugar industry can supply more than 2% of Queensland's electricity grid requirements. There is scope to significantly increase electricity

export by the sugar industry by improving the energy efficiency of sugar factories. This is more likely to happen if the appropriate financial drivers are in place to ensure an economic return that justifies the significant capital investment required.

Market, regulatory, and infrastructure barriers to increased bioenergy production from sugar.

Currently there are significant barriers to further investment in sugar factory cogeneration in Australia.

A recent paper by QUT's Dr Anthony Mann¹ addressed the barrier of low electricity prices (often negative prices) for wholesale electricity supplied into the electricity network for significant periods during the crushing season. This is a major barrier to developing projects that have the potential to increase renewable energy generation from the sugarcane industry.

Infrastructure costs to connect and / or increase the amount of electricity that can be exported to the grid is another barrier to expanding the amount of cogeneration from the sugarcane industry. Together with the high costs of deploying energy efficiency technologies in sugar factories, these barriers result in limited investment in these opportunities. The outcomes of this are that the significant potential that the sugar industry has to increase its electricity generation, and export is not being realised.

Policy and funding mechanisms to de-risk investment in cogeneration and biofuels by manufacturers and growers, including examples of successful policy implementation from overseas and other industries.

Effective policy and funding measures are critically important to de-risking bioenergy investments by providing system guidance and mobilising resources for investment.

In the early 2000's the Queensland Government funded a portfolio of investment in research through a Sugar Industry Renewable Energy (SIRE) program which led to the de-risking of energy efficiency technologies for the sugar industry. Research has a key role to play in enhancing the technology readiness of technologies for commercial investment.

The introduction of biofuels, bioenergy and bioproducts technologies has been achieved in other countries through a suite of technology measures. The attached Growing Australia's Bioeconomy report introduces several policy measures in place in other countries that provide a valuable reference for future Queensland policy.

The Growing Australia's Bioeconomy report lays out a pathway to unleash the potential for Australia. These include:

1. Develop a national bioeconomy strategy.
2. Cultivate world-class, economic and scalable bioeconomy feedstocks.
3. Build infrastructure to scale bioeconomy solutions.
4. Grow bioeconomy workforce skills.
5. Invest in bioeconomy research, development and translation.

Many of these recommendations could equally be applied or adapted to support growing the sugarcane bioenergy sector in Queensland.

¹ Mann 2025. Electricity export by the Australian sugar industry. ASSCT 2025.

The R&D agenda to underpin a world leading sugar-led bioenergy industry.

R&D is critical to ensuring a resilient and profitable future for the sugar industry. With rapid advances in science and technologies including artificial intelligence and machine learning, Industry 4.0, synthetic biology and biomanufacturing, there is a need for continued advancement to stay competitive with competitor industries.

Despite the significant potential, the application and integration of bioenergy technologies in the sugar milling industries often require complex aspects relating to market dynamics, integration challenges, capital requirements for energy efficiency upgrades and adaptation of technologies for Australian sugarcane feedstocks.

To support future opportunities for the sector, and realise benefits for Queensland and regional communities, the establishment of a focussed research and training program should be considered. Such a program would:

- Undertake international technology scanning and adapt these technologies for the Australian sugar industry environment,
- Undertake pilot and factory demonstration of technologies,
- Advance knowledge to decrease the costs of technology deployment, and
- Develop skills and expertise to support deployment across the sector.

QUT is currently developing an Adding Value to Agriculture Cooperative Research Centre (CRC) program that aims to harness Australia's world-class research, industrial strengths, and export markets to scale high value bioenergy and bioproducts technology. This CRC has the potential to support the sugar industry in further advancing bioenergy technologies supporting Australia's biomanufacturing capabilities, aligned with state and national priorities. With support from the Queensland Government and industry, this CRC could form an appropriate mechanism for a sugar industry bioenergy technology development and deployment program.

Consideration of food verses fuel

Australia exports about 70% of its agricultural output including around 85% of Australian sugar production.

Currently the Australian sugar industry uses bagasse to produce bioenergy (heat and electricity through cogeneration) and molasses to produce ethanol. However, there is potential to utilise lower-value sugar streams (e.g. various grades of molasses) to produce ethanol which can be used directly as a fuel or upgraded into sustainable aviation fuels through the Alcohol to Jet process. Strategic investment in this area aligns with the recently announced Sovereign Industry Development Fund aiming to accelerate industry development and new manufacturing capability for Biofuels in Queensland. Other potential options include the utilisation of sugarcane trash, mill mud, vinasse, or wastewater to produce other bioenergy products such as second-generation ethanol, and biogas – none of which would impact on sugar production for use as a food but would enhance the total revenue from the industry and support future profitability if the policy and economic conditions are right.

To ensure a food secure, healthy and sustainable future society, it will be important to address the inter-connected challenges of sufficient and affordable food and energy production while ensuring that we also address sustainability challenges including reducing carbon emissions. The sugar industry has an important role to play in contributing to both food **and** fuel production into the future.

Thank you again for the opportunity to provide this submission. For further information, please contact Professor Peter Prentis [REDACTED] or Professor Ian O'Hara [REDACTED].

Your sincerely



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Attachment- Growing Australia's Bioeconomy: Building a Sustainable Economic Future Report

This may be the author's version of a work that was submitted/accepted for publication in the following source:

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(2025)

Growing Australia's Bioeconomy: Building a Sustainable Economic Future.

Queensland University of Technology, Australia.

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Growing Australia's Bioeconomy

Building a Sustainable Economic Future



Supporting partners



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Brisbane, Australia

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All figures and infographics are original and were developed by Madeline R. Smith, with the exception of Figure 3.

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Executive Summary

The global bioeconomy is currently valued at USD 4 trillion and has the potential to grow to USD 30 trillion by 2050, representing a third of total global economic value (World Bioeconomy Forum, 2022).

The bioeconomy, or bio-based economy, harnesses renewable biological resources to deliver economic goods, processes and services in an environmentally sustainable manner. As a holistic framework, the bioeconomy integrates economic development with environmental and social well-being, offering a comprehensive response to the complex challenges of the 21st century.

Australia has a significant opportunity within the growing bioeconomy due to abundant and diverse natural assets (agriculture, forestry and fisheries production valued at AUD 92 billion in 2024–25) and advanced industries, strong sustainability credentials, reputation for clean, green and safe and research and innovation capacity (ABARES, 2025).

Key opportunities include diversifying revenue streams within primary industries (i.e. agriculture, forestry, fisheries and food) and agribusiness through onshore value-adding and developing emerging industries and new markets within a low-carbon future (e.g. bioenergy, advanced industrial biomanufacturing and critical minerals).

These opportunities will result in higher-value exports through secondary production, enhanced economic complexity and increase Australia's domestic and international market share. In addition, bioeconomic activity fosters resilient and vibrant workforces and industries, particularly within regional communities.

Australia stands at a critical juncture in the emerging bioeconomy. With key international trade partners already capitalising on new opportunities, decisive, collaborative action is imperative to secure our competitive edge in this rapidly growing global market.

Below are five key recommendations to advance Australia's bioeconomy.

1

Develop a national bioeconomy strategy that assesses existing capabilities, prioritises future growth opportunities, and identifies strategies to support market development, workforce needs and the realisation of benefits for Australia's regional economies.

2

Cultivate world-class, economic and scalable bioeconomy feedstock resources by investing in feedstock development and optimising and demonstrating farm-to-market supply chains.

3

Build infrastructure to scale bioeconomy solutions through funding for biomanufacturing infrastructure targeted at pilot and pre-commercial scales to accelerate commercialisation timeframes.

4

Grow bioeconomy workforce skills through expanding education and training programs in agriculture, biotechnology, biomanufacturing and related areas, with a focus on regional workforce development including vocational training, industry apprenticeships and universities.

5

Invest in bioeconomy research, development and translation through the establishment of a large-scale collaborative research program bringing together academia, industry and government to drive advancements in technology development and deployment.

A Bioeconomy for Australia

Complements resources, energy & industrial sectors: Bioeconomy supports the future of existing industries

Abundant biomass resources: Established and technologically advanced agriculture sector

Access to global markets: Strong trade links with Asia Pacific for exports of bio-based products

Unique environment and biodiversity: Australia's unique biodiversity offers opportunity for innovation

Efficient logistics and supply chains to global markets: Advanced infrastructure for sustainable value chains

Reputation for clean, green, safe: Trusted sustainability credentials & regulatory standards

Research and innovation capability: Leading research capability in engineering biology & complementary areas

Growth Opportunities

Biomanufacturing a wide range of products & materials

Value-adding to Australia's primary industries

New foods and feeds complementary products & ingredients

BETS - Bioeconomy Equipment, Technology & Services

Waste to value supporting the circular economy

Renewable fuels & gases

Carbon, nature, & biodiversity markets

Enablers

Government support via agile policy & sustainability incentives

Abundant & diverse renewable resources

Growing global market demand

Research & innovation

Barriers & Challenges

Scaling feedstock production, aggregation, logistics & processing

Workforce & skill gaps

Infrastructure gaps

A Path Forward

1

Develop a national bioeconomy strategy

2

Cultivate world-class, economic & scalable bioeconomy feedstock resources

3

Build infrastructure to scale bioeconomy solutions

4

Grow bioeconomy workforce skills

5

Invest in bioeconomy research, development & translation

1. The Bioeconomy Opportunity

Australia is at a pivotal moment of economic transformation, driven by shifting global market preferences, rapid technological advancements and the move toward a low-carbon economy.

The Asia-Pacific region's growing population and rising economic prosperity are generating significant new demand for sustainable food, energy and materials, creating both domestic and international market opportunities for Australia (DFAT, 2025). At the same time, global commitments to carbon reduction and the resulting energy transition are reshaping industries. Over 7,300 corporations, financial institutions and Small and Medium-sized Enterprises (SMEs) globally have implemented validated, science-based emissions reductions targets (Science Based Targets Initiative, 2025).

These changes are unlocking significant opportunities for the Australian economy, particularly for primary industries that have the potential to benefit from the creation of new value-added supply chains and for the rural and regional communities around which these industries are based. These forces, underpinned by breakthroughs in technology and innovation in fields including engineering, synthetic biology and advanced manufacturing, are enabling new ways to create value from Australia's rich biological resources.

Australia has set ambitious targets to achieve net zero greenhouse gas emissions by 2050, aligning with the United Nations Sustainable Development Goals (SDGs) and the targets of many other countries (UNFCCC, 2015). Achieving these targets requires leveraging and expanding the nation's natural resource base, infrastructure and industries and world-leading expertise in science, technology and innovation.

Emerging bio-based industries present substantial opportunities to enhance agricultural productivity, develop new high-value manufactured bioproducts and

strengthen Australia's competitive position in global supply chains.

Historically, economic activity has relied on the production of many goods based on the extraction, use and disposal of nonrenewable resources. The bioeconomy offers a sustainable alternative, where renewable biological resources are efficiently produced, utilised, recycled and regenerated to create value in a circular system. This shift is critical not only for reducing environmental impacts but also for driving regional economic growth, securing and creating new jobs and increasing resilience in Australia's industries.

With a clear understanding that current practices are exceeding planetary boundaries, there is growing recognition that a transition towards the bioeconomy is essential for long-term prosperity (Richardson et al., 2023). Australia has a unique opportunity to benefit from this transformation, leveraging its strengths to build a profitable, sustainable and innovation-driven bioeconomy in support of a low-carbon future.



The bioeconomy is the production, utilization, conservation, and regeneration of biological resources, including related knowledge, science, technology, and innovation, to provide sustainable solutions (information, products, processes and services) within and across all economic sectors and enable a transformation to a sustainable economy.

International Advisory Council Global Bioeconomy, 2018

1.1 Scope and Impact of the Bioeconomy

The bioeconomy is an economic system that uses biological resources and related knowledge, technology and innovation to sustainably generate goods, processes and services. Operating as a dynamic and evolving system, the bioeconomy is based on principles such as circularity, sustainability and resilience (Figure 1).

The bioeconomy has a broad scope, encompassing local, regional, national and international contexts and spans terrestrial, urban and marine environments. It includes small-scale traditional primary production and expands to large-scale transnational economic activities (World Bioeconomy Forum & NatureFinance, 2024).

Key sectors within the bioeconomy include agriculture, aquaculture, food, materials, chemicals, energy, manufacturing, human health and environmental services. Beyond direct revenue and jobs from bioproduct markets, the bioeconomy can have broader indirect economic impacts through climate-related benefits, promoting biodiversity and biosecurity and supply security (Teconomy Partners LLC., 2024).

Early value derived within the bioeconomy has been heavily weighted towards the biopharmaceutical and human health industries, however significant opportunities extend beyond these sectors to areas like industrial biomanufacturing and bioenergy. For example, in the United States non-health bioeconomy sectors currently have an estimated USD 210 billion in direct economic impact supporting 430,000 jobs, with the potential to reach USD 400 billion by 2040 (BIO & Kearney, 2025)

The bioeconomy represents a shift towards a unified economic model that places science, knowledge and innovation at the centre of a sustainable society. This approach fosters the development of information, products, processes and services that drive economic opportunity while addressing environmental and societal needs (Figure 2).

Figure 1: The bioeconomy ecosystem. The outer blue ring represents core bioeconomic principles, the middle ring highlights key sectors and the inner gradient reflects impact areas. At the centre, science, knowledge and innovation underpin sustainable development.

Critical environmental challenges can be addressed through bioeconomy approaches, such as reducing greenhouse gas emissions, ensuring food security, extending product lifecycles, minimising waste, preserving the nation's unique biodiversity and meeting the demand for renewable materials.

In terms of economic and social benefits, the bioeconomy generates jobs, particularly in regional and rural areas, spurs economic growth and supports public health through the development of safer, more sustainable products. By fostering environmental stewardship alongside economic and social opportunities, the bioeconomy directly advances over half of the United Nations Sustainable Development Goals (SDGs) (United Nations, 2015).

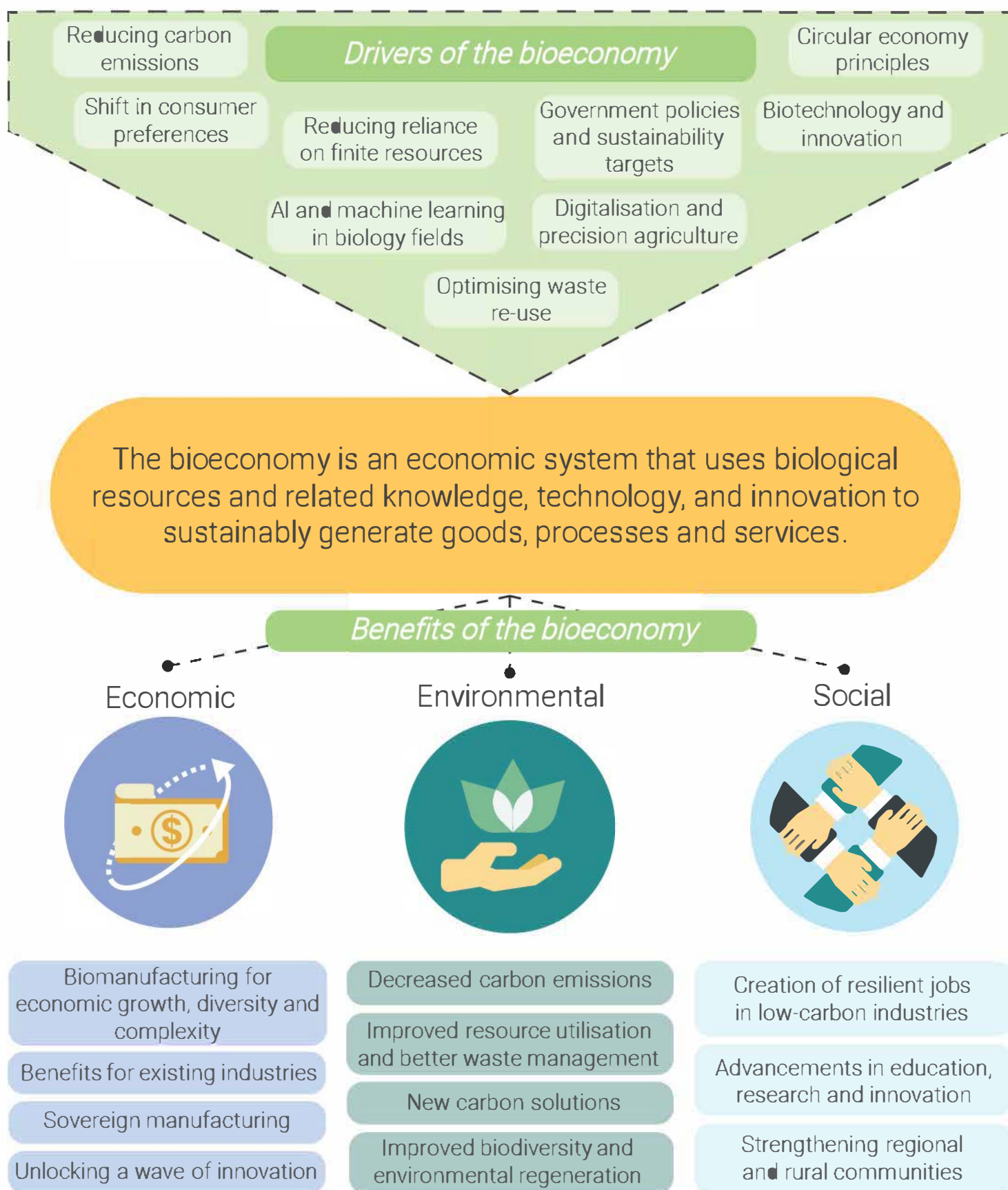


Figure 2: Bioeconomy drivers, definition and benefits. This figure presents a model of the bioeconomy, illustrating the interconnected drivers that propel its development. The bioeconomy is framed as a system that harnesses biological resources and innovative technologies to drive sustainable growth across a broad range of economic, environmental and social dimensions.

1.2 A Bioeconomy Founded on Science, Knowledge and Innovation

While bioeconomy principles have underpinned human civilisation over thousands of years, industrialisation over the past several hundred years has resulted in over-reliance on extraction of non-renewable (and particularly fossil-based) materials to support an increasing population and urban development. However, new science, knowledge and innovation are unlocking the ability to sustainably support human and planetary needs using Earth's renewable biological resources. These factors are also crucial drivers of economic growth (NatureFinance & Getúlio Vargas Foundation, 2024).

Synthetic biology is one example of a critical enabling technology within Australia's bioeconomy, underpinning advancements across multiple sectors, from biomanufacturing to agriculture and food.

By engineering biological systems to produce renewable molecules and materials, synthetic biology contributes to the development of high value bioproducts. This technology, with the potential to create AUD 30 billion in annual revenue and over 50,000 new jobs by 2040, is expected to play a key role in Australia's economic future (CSIRO and Main Sequence Ventures, 2023). The integration of synthetic biology with other emerging technologies strengthens Australia's capacity for innovation.

Bioeconomy development is also being driven by the development of advanced digital technologies, artificial intelligence (AI) and machine learning (ML) within agricultural and advanced manufacturing processes. These technologies enhance the productivity, flexibility and innovation of production and processing.

2. The Global Bioeconomy Landscape

Internationally, the bioeconomy is increasingly being recognised as a vital driver of economic growth, unlocking transformative social and environmental opportunities.

The European Union (EU) estimated that in 2021 the EU bioeconomy added EUR 728 billion in value and employed 17.2 million people (Ronzon et al., 2017, 2022). Germany is a major contributor to the EU bioeconomy, with biomass production and conversion sectors employing 2.07 million people and adding EUR 135 billion to the country's economy (Ronzon et al., 2017, 2022). The Association of Southeast Asian Nations (ASEAN) values bioeconomic outputs at over USD 2 trillion annually and attributes 8% of employment to the bioeconomy across agriculture, food manufacturing and primary resource extraction (World Bio Market Insights, 2023). Meanwhile, China estimates the value of its bioeconomy will reach CNY 22 trillion (approximately USD 3.3 trillion) by 2025, driven by substantial investments in biotechnology and emerging bio-based industries (ADB, 2021). The United States' bioeconomy is valued at over USD 950 billion, more than 5% of gross domestic product (GDP) (Jeffery, 2024).

The metrics used to measure and monitor the size and value of the bioeconomy differ between studies, meaning these values are not all directly comparable. However, they do highlight the growing value of the bioeconomy as a key driver of sustainable economic development. The most common metrics used when quantifying bioeconomy are economic indicators such as value addition, job creation, turnover and foreign sales and investments (NatureFinance & Getúlio Vargas Foundation, 2024).



2.1 International Strategies and Comparisons

The global bioeconomy is shaped by diverse national strategies that reflect the unique natural resources, industrial landscapes and economic priorities of individual countries and regions (Dietz et al., 2024; IACGB, 2020).

According to the Food and Agriculture Organisation of the United Nations (FAO) 26 countries and macro-regions have dedicated ongoing bioeconomy strategies, with an additional 15 under development (Figure 3) (FAO, 2023).

By comparison, Australia has developed a variety of strategies, roadmaps and action plans at both state and federal levels that touch on thematic aspects of the bioeconomy. These plans target specific areas such as bioenergy, biomanufacturing, synthetic biology and agricultural innovation. However, Australia currently lacks a unified, comprehensive, national bioeconomy strategy that integrates these into a cohesive framework. Developing a national strategy will be essential in enabling Australia to be competitive and increase its share of the global bioeconomy market.

In 2016 (and subsequently updated in 2022) the Queensland Government published a Biofutures 10-year Roadmap and Action Plan to position Queensland as a world-leading and sustainable region for bio-based industries (Queensland Government, 2022). Key progress has focussed on emerging industries such as sustainable aviation fuels.

National bioeconomy strategies and action plans provide a coordinated framework that aligns innovations with a nation's overarching economic, environmental and social objectives. In addition, subnational and supranational strategies can reflect the more specific opportunities of a state, industry, or broader collaborative international interests, and can co-exist in alignment with national strategies.

Such frameworks enable more efficient allocation of resources, foster long-term sustainability and promote collaboration and innovation, while positioning the state, country or region to engage more actively in global bioeconomy collaborations and trade. The following examples of strategies from other countries and regions offer valuable insights that can inform Australia's efforts in building a robust and sustainable bioeconomy.

Figure 3: Countries with dedicated bioeconomy strategies. While many leading economies across Europe, the Americas and parts of Asia have adopted comprehensive bioeconomy frameworks, Australia remains a notable exception. Source: Global Bioeconomy Dashboard, FAO, 2025.

European Union (EU)

The EU has made sustainability the cornerstone of its bioeconomy strategy, which was first launched in 2012 and updated in 2018 to reflect the policy priorities and identify action points. This was followed by a progress report in 2022 that showed the bioeconomy grew by 39% over a ten-year period, driven predominately by biomanufacturing sectors (Lasarte & M'barek, 2024). The EU's overarching goal is to promote sustainable economic growth by integrating bio-based solutions across sectors such as agriculture, energy and manufacturing. This strategy prioritises the transition to a circular economy, aiming to decrease dependence on fossil resources and tackle critical environmental challenges including climate change and biodiversity loss. Specific measures include the European Circular Bioeconomy Fund (ECBF), an EUR 300 million initiative designed to support start-ups and scale-ups (European Investment Bank, 2024). Another key initiative is the EU Bioeconomy Monitoring System, which tracks progress toward sustainability and innovation by monitoring indicators related to ecosystem health, primary production systems, waste management and circularity, secondary production systems and trade (Knowledge Centre for Bioeconomy, 2024). Additionally, the bioeconomy strategy aligns with the EU's Green Deal and industrial plan, which seeks to reduce greenhouse gas emissions by at least 55% by 2030, with emerging bio-based industries playing a pivotal role in this transition (European Commission, 2023).

Germany

Germany has positioned the bioeconomy as a central pillar of its national sustainability agenda, as outlined in its National Bioeconomy Strategy adopted in 2020 (Federal Ministry of Education and Research, 2020). The overarching aim of the strategy is to transition toward a sustainable, climate-neutral, circular economy by responsibly integrating biological resources and knowledge into key bioeconomy sectors such as agriculture, aquaculture, forestry and energy. Specific measures include significant investments in research and innovation through programs like Bioeconomy International, funded by the Federal Ministry of Education and Research (BMBF), which supports international research collaboration (Federal Ministry of Education and Research, 2023). Additionally, the Federal Ministry of Food and Agriculture (BMEL) promotes the use of renewable resources through initiatives managed by the Agency for Renewable Resources (FNR) (Federal Ministry of Education and Research, 2023).

United States

The United States' bioeconomy has centred bold innovation and domestic biomanufacturing capacity, with the objectives of national security and economic competitiveness. Since the early 2000s, there have been national policies supporting the bioeconomy (Gallo, 2022). Additionally, state-level support remains persistent. Current examples include Nebraska's investment in cutting-edge biorefinery infrastructure for processing renewable biomass and Iowa's network of dedicated biofuel blending facilities (Bioenergy International, 2025; USDA, 2025). A national focus on advanced digital technologies, such as AI and ML, are underpinning a data-driven bioeconomy (The White House, 2025). Bioeconomy development is supported by key programs such as BioPreferred which promotes bioproducts in federal procurement, creating a demand and securing domestic supply chains (United States Department of Agriculture, n.d.). Another significant initiative is BioMADE (Bioindustrial Manufacturing and Design Ecosystem), a public-private partnership with over USD 500 million in federal funding to accelerate domestic biomanufacturing (BioMADE, 2024).

Case study: Leveraging Local Strengths in Germany's regions

Germany exemplifies how leveraging local strengths can effectively propel a nation's bioeconomy. Supported by robust public-private partnerships and strong research capabilities, Germany's bioeconomy thrives through collaboration between federal and state governments, research institutions and industry stakeholders. This synergy fosters innovation and sustainable growth across diverse areas.

Several German states have tailored their bioeconomy initiatives to capitalise on local resources and industrial competencies while aligning with national and EU bioeconomy strategies. For instance, Baden-Württemberg focuses on urban bioeconomy solutions (e.g. resource recovery) and industrial transition, capitalising on its strong automotive sector and advanced manufacturing landscape (Ministry of the Environment, Climate Protection and the Energy Sector Baden-Württemberg & Ministry of Food, Rural Affairs and Consumer Protection Baden-Württemberg, 2024). This state-level specialisation maximises local expertise through working closely with local government and collaborative networks, such as the Sustainable Bioeconomy Council, to implement tangible transition measures, while also contributing to national objectives (Ministry for the Environment, Climate and Energy Sector Baden-Württemberg & Ministry of Food, Rural Areas and Consumer Protection Baden-Württemberg, 2024).

In Bavaria, the city of Straubing has emerged as a 'bioeconomic model region,' emphasising the development of bio-based chemicals and renewable resources (Bavarian Ministry of Economic Affairs, Regional Development and Energy, 2020). By harnessing its agricultural strengths, fostering close collaboration between academia and industry and creating an ecosystem that incentivises company creation and scaling infrastructure (e.g. BioCampus and MultiPilot (BMP)), Straubing demonstrates how localised efforts can have significant national impact (Straubing-Sand Port Association, 2024).

Germany's approach is bolstered by significant funding programs at both the national and EU levels. Programs like Horizon Europe provide financial support for fundamental research, scaling and commercialisation efforts, international partnerships and public-private collaborations (Directorate-General for Research and Innovation, 2024). These funding mechanisms enable diverse projects to flourish, from foundational research to market-ready innovations.



Case study: Collaborative Approaches to Accelerating the Bioeconomy – USA's BioMADE Model

Launched in 2021, BioMADE is a U.S. Department of Defense-backed initiative designed to accelerate biomanufacturing innovation across the nation (BioMADE, 2024). By focusing on building a robust bioindustrial ecosystem, BioMADE aims to reduce reliance on foreign supply chains, enhance national security and foster domestic biomanufacturing capabilities. The program targets key sectors such as renewable chemicals, bio-based materials and pharmaceuticals, positioning the United States at the forefront of sustainable bio-based innovation.

Since its inception, BioMADE has invested over USD 166 million in more than 75 projects, driving advancements in synthetic biology, bioengineering and sustainable manufacturing processes (Johnson, 2024). By fostering collaboration between industry, academia and government, BioMADE bridges the gap between groundbreaking research and commercial production. Its emphasis on public-private partnerships and strategic investments has not only spurred technological innovation but also contributed to workforce development and the creation of high-quality jobs within the bioeconomy sector.

A key aspect of the program is its focus on developing an educated workforce and de-risking large-scale projects, which has been instrumental in transforming innovative research into market-ready solutions (BioMADE, 2023). BioMADE's success underscores the effectiveness of large-scale, coordinated initiatives in advancing an industrialised nation's bioeconomy for enhancing economic resilience.

Case study: China Driving Innovation Through Research-Driven Bioeconomy

China's rapid ascent in the global biotechnology arena is fuelled by a coordinated, top-down strategy that integrates education, research, entrepreneurship and manufacturing (ADB, 2021; CNCBD, 2025).

National initiatives such as the 14th Five-Year Plan and Made in China 2025 set clear priorities, mobilising vast resources to develop specialised universities, state-of-the-art research institutes and innovation hubs (State Council of the People's Republic of China, 2021). These measures secure a robust talent pipeline and drive breakthroughs in synthetic biology, gene editing and advanced biomanufacturing.

A cornerstone of this approach is the National Key R&D Programme, which channels a multi-billion-dollar investment to bridge fundamental research and commercial application (Ministry of Science and Technology of the People's Republic of China, 2016). This initiative not only aligns research priorities with industry needs but also fosters biotech clusters in cities such as Shanghai and Shenzhen through strong public-private partnerships and state-backed investments (Huld, 2024; Schmid & Xiong, 2021). Beyond driving innovation, the model strengthens the domestic supply chain by reducing reliance on external inputs, ensuring that China's biomanufacturing sector remains agile and competitive in the global market.

For Australia, adopting a similarly integrated and strategic approach presents a transformative opportunity. By leveraging its world-class research institutions and abundant natural resources, Australia can cultivate dynamic biotech hubs through targeted public-private alliances and strategic policy initiatives, ultimately driving high-value job creation, technological advancement and enhanced global competitiveness.

China

China's bioeconomy strategy, outlined in its 14th Five-Year Plan (2021-2025), positions biotechnology as a driver for industrial transformation and economic leadership (ADB, 2021). The strategy focuses on the biopharmaceutical sector, aiming to boost innovation in drug development, increase R&D and advance biotechnology manufacturing capabilities, with long-term goals set for 2035. In support, China has introduced specific policy measures to strengthen the governance and legal frameworks that underpin bioeconomy growth. These measures include improvements in drug and medical device approval processes, reforms to the medical insurance system to enhance healthcare accessibility and quality and stronger IP protections for innovation. Additionally, China is focusing on expanding financial support, including venture capital and foreign investments, while developing bioeconomy pilot zones to explore new technologies and business models. These efforts are complemented by initiatives to cultivate interdisciplinary talent and promote collaboration on global health and biodiversity conservation.

Japan

Japan's Bioeconomy Strategy, formulated in 2019, focuses on leveraging advanced biotechnologies to drive innovation, reduce fossil fuel dependency and promote sustainability to create the world's most advanced bioeconomy society by 2030 (Council for Integrated Innovation Strategy, 2019). This strategy aligns with Japan's cultural emphasis on environmental stewardship and nature-centric living, positioning the bioeconomy as the foundation for a sustainable, healthy society. Key focus areas include high-performance biomaterials and bioplastics, sustainable primary production systems, large-scale wood-based construction and advancements in healthcare, such as biopharmaceuticals and regenerative medicine. To achieve these objectives, Japan has allocated substantial funding, including JPY 500 billion for biomanufacturing, and established a rigorous policy framework involving annual strategy revisions and comprehensive reviews every five years (Dietz et al., 2024).

India

India aims to leverage its large agricultural resources and rich biodiversity to drive industries. In August 2024, India published the BioE3 Policy (Biotechnology for Economy, Environment and Employment), which aims to propel high-performance biomanufacturing to enable the national bioeconomy to reach a value of USD 300 billion by 2030 (Department of Biotechnology, 2024). This plan builds upon initiatives such as the National Policy on Biofuels (2018) and subsequent amendment (2022), and the Make in India campaign (Government of India, 2022; Ministry of Petroleum and Natural Gas, 2018). The BioE3 will support R&D and entrepreneurship across six thematic sectors through establishing biomanufacturing hubs with pilot and pre-commercial manufacturing facilities to support researchers and SMEs (Ghosh & Priyadarshini, 2024).

2.2 International Cooperation

Multilateral organisations are shaping the global bioeconomy by setting standards, encouraging collaboration and facilitating the exchange of knowledge. For example, the FAO's Bioeconomy Guidelines support the sustainable management of biological resources and advocate for the integration of bioeconomy principles into national policies in line with SDGs (FAO, 2021).

The G20, through its Bioeconomy Initiative, has advanced the global bioeconomy by promoting cooperation between member countries and creating a global framework that supports the development and sustainability of industries (Ministry of Foreign Affairs and the Secretariat of Social Communication of the Presidency of the Republic of Brazil, 2024). The recent release of the G20 High-Level Principles on Bioeconomy underscores this commitment, providing a voluntary, non-binding set of guidelines. These principles advocate for the circular use of biological resources, the conservation of biodiversity and the mitigation of climate change, while promoting inclusive practices and equitable participation from all stakeholders, including Indigenous Peoples and local communities.

3. Leveraging Australia's Competitive Advantages

The Australian economy, with a GDP of approximately USD 1.7 trillion is predominantly driven by resource-based industries such as mining, energy and manufacturing (The World Bank Group, 2024).

These sectors have historically been the backbone of national prosperity, significantly contributing to GDP and employment. As the global landscape shifts towards circularity of resources and low-carbon industries, there is an imperative for economic diversification and a transition to sustainable production and practices. The growing demand for sustainable bioproducts in key export markets in the Asia-Pacific highlights this opportunity. Additionally, there is the opportunity to fulfil the need from large domestic industries for bioproducts like agricultural chemicals, fertilisers and specialised chemicals.

3.1 Australia's Advantages for Growing a Bioeconomy

Australia is uniquely positioned to develop a thriving bioeconomy by leveraging its abundant biological resources, unique biodiversity, efficient logistics and strong reputation for clean and safe products.

This aligns with the nation's broader objectives to strengthen domestic manufacturing, capitalise on global economic shifts, drive climate action and promote environmental stewardship.



Diverse agricultural base and feedstock availability

Australia's abundant and diverse natural resources represent one of its strongest assets contributing significantly to both domestic and export markets. Along with natural resources, Australia has well-established primary industries infrastructure, efficient supply chains, agricultural expertise and strong reputation for producing clean, green and safe products.

There are large-scale and diverse primary industry outputs, including sugarcane, grains, cotton, oilseeds, horticultural products, forestry, fisheries, aquaculture and livestock, which can be leveraged as feedstocks for bioeconomy industries. Currently, nearly 70% of Australia's agriculture, fisheries and forestry production is exported as raw commodities, valued at AUD 75.6 billion (2023-24 FY) (Department of Agriculture, Fisheries and Forestry, 2025). This represents a significant opportunity through adding value to these resources onshore and reduce import reliance.

Efficient logistics and supply chains to global markets

Australia has efficient logistics and advanced supply chain infrastructure which enhance its ability to export bioproducts to key global markets. The country boasts deep-water ports and well-developed transportation networks, enabling high-volume shipping and efficient delivery of goods. In the 2023-24 FY, the majority of agricultural, fisheries and forestry products were exported to Australia's largest markets in China, ASEAN economies, Japan and South Korea (Department of Agriculture, Fisheries and Forestry, 2025). This connectivity to key global markets positions Australia to capitalise on growing international demand for sustainable bioproducts.

Reputation for clean, green and safe

Australia's robust regulatory frameworks and commitment to sustainability have fostered a strong international reputation for producing clean, green and safe products. Regulatory bodies such as the Food Standards Australia New Zealand (FSANZ) and Office of the Gene Technology Regulator (OGTR) enhance market confidence of products by ensuring they meet appropriate health, safety and environmental standards.

Unique environment and biodiversity

Over 80% of Australia's flora and fauna are endemic, representing a diverse and unique resource for bioprospecting and developing innovative bioproducts, while also elevating Indigenous communities economically (Commonwealth of Australia, 2021). In addition to terrestrial biodiversity, Australia's oceans, forests and iconic landscapes, such as the Great Barrier Reef, offer potential for sustainable aquaculture, marine bioproducts and ecotourism. These natural resources, when managed appropriately, can support both environmental conservation and economic utilisation.

Research and innovation capability

Research and innovation are key strengths that can underpin Australia's bioeconomy development. The nation's world-class research capability and infrastructure, particularly in biotechnology and engineering, has the potential to support the industrialisation of new industries and products. As one example, the Mackay Renewable Biocommodities Pilot Plant (MRBPP) operates to support the commercialisation of bioproducts and has recently undergone an AUD 18 million upgrade to better support the commercialisation of synthetic biology and precision fermentation-based products (Queensland University of Technology (QUT), 2024).

4. A Bioeconomy for Australia

By focusing on key sectoral opportunities, pursuing innovative technology and business models and working collaboratively, Australia has the potential to develop a vibrant bioeconomy tailored to its unique national strengths.

4.1 Key Growth Opportunities

An Australian bioeconomy will support existing industries while also advancing government-priority technologies in advanced manufacturing and materials, biotechnology and clean energy generation and storage (Department of Industry Science and Resources, 2023).

Australia's bioeconomy is poised for significant growth resulting from developments in new feedstocks, bioproduct markets and renewable energy solutions. Harnessing innovations in these areas can unlock greater economic and social potential while advancing sustainability outcomes.

Industrial biomanufacturing

Biomanufacturing is the production of goods using biological processes or resources. Some of Australia's existing primary industries undertake biomanufacturing processes to produce products including bioethanol, biodiesel, biochar and biofertiliser, however the opportunity exists to vastly increase the range and complexity of materials being manufactured.

Industrial biomanufacturing can be used to produce a broad range of products, including biofuels, bioplastics and biopolymers, food and beverage ingredients, biochemicals, construction materials, agricultural products, personal care products and cosmetics, textiles and fibres, industrial enzymes and chemicals, renewable energy products and advanced materials servicing export and domestic markets.

The development of new synthetic biology technologies further enhances Australia's biomanufacturing capability by unlocking new feedstocks, products and processes (CSIRO Futures, 2021). A recent policy options paper has further highlighted the strategic opportunity of biomanufacturing for Australia, recommending the establishment of an industrial biomanufacturing strategic plan, investment in scale up and first-of-kind demonstration facilities, feedstock and skills development (van der Kley et al., 2024).



Value-adding to Australia's primary industries

Australia's existing primary industries is a key part of the Australian economy with a total value of production of AUD 100.1 billion (ABARES, 2024). In the future these industries will play an essential role in providing raw materials for bioeconomy industries. Potential resources of significant scale in Australia include sugarcane, grains, cotton, wood, fats, oils and grease. The byproducts and residues from the production and processing of these resources, such as sugarcane bagasse, wheat straw, used cooking oil, and industrial waste offer additional potential without competing with existing food and resource demands.

There is a significant opportunity for raw materials, byproducts and residues to have value added onshore through biomanufacturing and other transformative processes. Value-addition has the potential to increase economic returns, complexity and competitiveness, as well as create jobs within primary industries in Australia. It can also offer diversified and complementary income streams to these businesses. Additional farm revenue from resource-based industries has been estimated to have the potential to increase to between AUD 5.7 billion to AUD 11.4 billion per year by 2050 (O'Hara et al., 2018). Initiatives in the red meat, pork and dairy industries aim to capture maximum value from waste, contributing to more sustainable and profitable practices (Ramirez et al., 2021).



New foods and feeds

The global demand for sustainable complementary food products and ingredients presents a significant opportunity for Australia, with the national opportunity valued at AUD 13 billion (CSIRO Futures, 2022). Australia is at the forefront of developing complementary proteins, including plant-based proteins, microbial-derived proteins, cultivated meats, and algal and insect-derived feeds.

Precision fermentation is a key enabling biotechnology that will support efficient production of products at scale, increasing Australia's sustainable protein production. By leveraging expertise in agriculture and biotechnology innovation, expanding infrastructure and fostering a regulatory system to support these innovative food technologies, Australia can advance progress in technologies to support rising global protein demand and create new export market opportunities (Freitag, 2024).

Low-carbon liquid fuels (LCLF)

Australia's Bioenergy Roadmap identified that the bioenergy sector could contribute AUD 10 billion in additional GDP per year, add 26,200 new jobs and reduce emissions by about 9% by the 2030s (ENEA and Deloitte for ARENA, 2021). Additionally, a recent Deloitte report identified that developing a diversified LCLF production technology portfolio could displace 19% of Australia's fuel imports by 2040 and 47% by 2050, while a combination of LCLF with electrification could have an import reduction of up to 60% between 2040 and 2050 (Deloitte, 2025).

Within bioenergy, Australia is strategically positioned to be a leader in the LCLF sector, which will be crucial in decarbonising hard-to-abate industries such as aviation, marine transport and heavy industry. In 2022, Australia produced a total of 175 million litres of bioethanol from wheat starch and sugarcane and 15 million litres of biodiesel, using a mix of used and virgin vegetable oil as well as tallow (Biki, 2022). Current production is minimal compared to the estimated annual global demand by 2028 of 117.5 billion litres and 26.4 billion litres of bioethanol and biodiesel respectively (IEA, 2024). The country's abundant and diverse resources and robust renewable energy infrastructure provide a strong foundation for significantly increasing the production of advanced liquid biofuels.

Developing sustainable aviation fuels (SAF) is a priority area given the emissions intensity and lack of alternative decarbonisation technologies for the sector. It is estimated that Australia has sufficient feedstock to produce 60% of domestic jet fuel demand currently growing to 90% in 2050 representing AUD 19 billion worth of fuel (CSIRO, 2023). By advancing advanced biofuel production and technologies, Australia can enhance energy security, reduce reliance on imported fuels and contribute to emissions reductions.

Renewable gases

Renewable gases, such as biogas and biomethane, renewable hydrogen and syngas also present an opportunity for Australia in the transition to a low-carbon economy. These gases can be derived from organic waste and wastewater, offering a sustainable alternative to traditional fuels, particularly in sectors like transport and manufacturing. According to projections, Australia's gas pipelines could incorporate 105 PJ of renewable gas accounting for 23% of the total pipeline gas market by the 2030s (Enea and Deloitte for ARENA, 2021). By converting waste products into a valuable energy source, Australia can reduce greenhouse gas emissions using over 142,000 km of existing pipeline infrastructure and support jobs in regional areas (Energy Networks Australia, 2024).





Waste to value industries

Waste to value projects can enhance the economic value and complexity of several sectors and aid in the transition towards a low-carbon economy. Australia produced 75.6 million tonnes of waste, including 26.8 million tonnes of building and construction materials and 14.6 million tonnes of organic wastes in the 2022/23 FY (Blue Environment Pty Ltd, 2025). Australia has the goal of achieving a 80% average recovery rate from all waste streams and diverting half of organic waste sent to landfill by 2030 (DCCEE, 2024). Through promoting the conversion of organic, commercial and industrial, municipal and construction and demolition waste to valuable products and energy, waste to value industries can add economic value while reducing landfill and lowering greenhouse gas emissions.

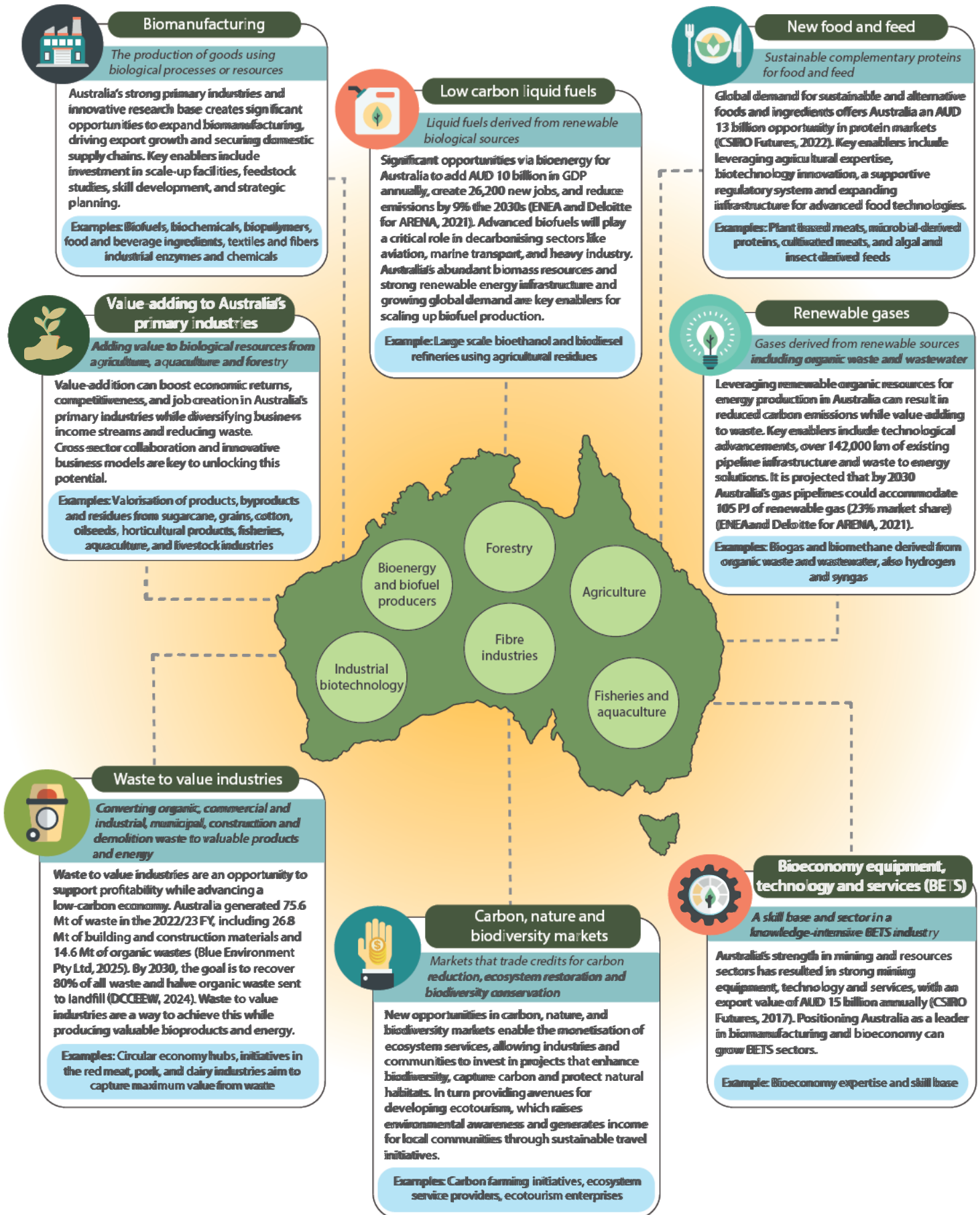
Carbon, nature and biodiversity markets

Australia's commitment to achieving net zero greenhouse gas emissions by 2050 and other sustainability initiatives has opened new opportunities in carbon, nature and biodiversity markets. These markets enable the monetisation of ecosystem services,

allowing industries and communities to invest in projects that enhance biodiversity, capture carbon and protect natural habitats. Additionally, they provide avenues for developing ecotourism, which raises environmental awareness and generates income for local communities through sustainable travel initiatives. This follows current market trends, evidenced by a 2024 booking.com report showing over 75% of global travellers want to travel more sustainably in the year of the survey (Booking.com, 2024). Through participating in these markets, Australia can drive investment in conservation efforts, support rural and regional communities and foster innovation in sustainable land management practices.

Bioeconomy Equipment, Technology and Services (BETS)

Australia's strength in the mining and resources sectors has resulted in the development of a strong mining equipment, technology and services sector with exports from the sector being valued at approximately AUD 15 billion annually (CSIRO Futures, 2017). Through positioning Australia as a leader in biomanufacturing and bioeconomy, Australia has the potential to grow an equivalent skill base and sector in the knowledge intensive BETS industry.



4.2 Economic, Environmental and Social Benefits of an Australian Bioeconomy

Economic



Biomanufacturing for economic growth, diversity and complexity

- Contributes to GDP growth through sectors like bioenergy, bioplastics, pharmaceuticals and advanced materials
- Producing high-value bioproducts domestically enhances economic complexity and export potential, supporting regional diversification and skilled job creation

Benefits for existing industries

- Integrating sustainable practices improves competitiveness in agriculture, tourism and other industries
- Ecotourism benefits from biodiversity conservation, enhancing national economic strength

Sovereign manufacturing

- Boosts sovereign manufacturing, reducing reliance on imports and fostering Australian made products
- Enhances national security, prepares for supply chain disruptions and strengthens Australia's global market position

Unlocking a wave of innovation

- Drives innovation via start-ups and corporate investments
- Increased public-private funding will accelerate output of high-value technologies, enhancing economic competitiveness and creating export opportunities

Environmental



Improved resource utilisation and better waste management

- Repurposing agricultural residues and food waste for bioproduction decreases landfill use and greenhouse gas emissions
- Fosters a circular economy and maximises resource efficiency

Decreased carbon emissions

- Biofuels and bioenergy reduce reliance on fossil fuels for cleaner energy in hard-to-abate sectors like aviation, where emissions can be reduced by 80% (CSIRO, 2023)
- Supports Australia's transition to a low-carbon economy while improving energy security

New carbon solutions

- Processes like afforestation, reforestation and soil carbon enhancement increase carbon sequestration capacity
- Enables Australia to achieve mandated emissions reduction targets of 43% by 2030 and net zero by 2050 (Climate Change Act 2022, 2023)

Improved biodiversity and environmental regeneration

- Innovations like regenerative agriculture and advanced biotechnologies restore soil health, improve ecosystem services and enhance biodiversity

Social



Creation of resilient jobs in low-carbon industries

- Projected to create 50,000 skilled jobs by 2040 in biomanufacturing, biofuels and agricultural biotechnology (CSIRO, 2024)
- Roles in logistics, infrastructure and professional services will support industry growth, employment and economic stability

Strengthening regional and rural communities

- Drives growth in regional Australia by creating industries rooted in local resources and expertise
- Initiatives (e.g. Mackay Future Foods BioHub, Victorian Bioenergy Network) build resilient, self-sufficient communities, reduce reliance on urban centres and support balanced national development (The Department of State Development, Tourism and Innovation, 2020)

Advancements in education, research and innovation

- Investments in bioeconomy related research and education equip Australians with the skills needed for emerging industries (e.g. ARC Centre of Excellence in Synthetic Biology and Food and Beverage Accelerator (FaBA))

5. Enablers, Barriers and Challenges

5.1 Enablers

The growth of Australia's bioeconomy will be enabled by several key factors. Government support is critical, with policies and programs that support early-stage industry development and a favourable regulatory environment essential for the development of emerging bio-based industries. This support will help to drive innovation, attract onshore investment and ensure the long-term viability of these industries. Additionally, the Australian public has a generally favourable view of responsible innovation given there is a clear imperative, which is further benefited by supportive governance (McCrea et al., 2024)

Australia has several competitive advantages that enable the bioeconomy opportunity. These include primary industries with vast resources to theoretically supply new bioeconomy markets, a well-regarded reputation for Australian products, existing trade partnerships, supply chains and logistics. These factors, underpinned by the nation's strong research and innovation capabilities and increasing modularity and decentralisation of manufacturing processes will support the development of new Australian made bioproducts, processes and services.

There is currently a growing demand for bioproducts globally, particularly in the Asia-Pacific region, presenting significant opportunities for Australian businesses (Sharma, 2024). Furthermore, the shifting political landscape incentivises securing domestic supply chains through onshore manufacturing.

5.2 Barriers and Challenges

Despite these enablers, several barriers must be addressed to realise the full potential of Australia's bioeconomy. Australia currently lacks a clear and comprehensive national bioeconomy strategy which is essential to provide direction, coordination and investment certainty for the sector. Without a unified approach, fragmented policies and inconsistent regulatory frameworks risk stifling innovation and slowing industry growth (ATSE, 2025).

Reliable and sustainable access to feedstocks is fundamental to bioeconomy industry growth. However, challenges in scaling feedstock production, aggregation, logistics and processing can constrain supply chain development. Australia's bioeconomy will require significant development and demonstration of efficient and scalable supply chains to unlock large-scale investment opportunities.

As bioeconomy industries develop, there will be demand for a skilled and adaptable workforce across all levels and multiple sectors, including agriculture, supply chain logistics, biotechnology, biomanufacturing and business management. Existing skills shortages, particularly in regional areas, present challenges in ensuring a pipeline of talent to support sector growth.

While Australia has strong research capabilities, translating innovations into commercial success remains a challenge. In terms of benefiting from the bioeconomy, implementation is as important as innovation. Strengthening coordination and creating targeted programs to unlock technology translation can help bridge these gaps, ensuring that research efforts align with industry demands and lead to tangible investment and market outcomes.

6. Strategic Pathways for a Sustainable Bioeconomy

1

Develop a national bioeconomy strategy

Formulate a comprehensive national strategy that assesses existing capabilities, prioritises and quantifies future growth opportunities and identifies approaches to support market development, workforce needs and the realisation of benefits for Australia's regional economies. This strategy could inform the development of specific priorities for different regions, identify approaches to unlock Australia's feedstock and biomanufacturing potential, highlight measures to accelerate sectoral growth and outline the economic case for investment.

2

Cultivate world-class, economic and scalable bioeconomy feedstock

Increase the scale, improve the efficiency and strengthen the resilience of Australia's feedstock supply chains by investing in feedstock development and optimising and demonstrating farm-to-market supply chains. Access to large-scale, cost-effective feedstocks is a critical input for all bioeconomy industries and there is significant potential to enhance availability and affordability through new feedstock development programs and through demonstration trials focussed on targeted reductions in supply chain costs.

3

Build infrastructure to scale bioeconomy solutions

Address the critical need for infrastructure to bridge the technology deployment gap in scaling innovations from laboratory to commercial. This includes funding for biomanufacturing infrastructure targeted at pilot and pre-commercial demonstration stages and facilitating public-private partnerships to enhance outcomes. This infrastructure will minimise the capital and time barriers in capital-intensive technology projects and accelerate the commercialisation and deployment of new bioeconomy technologies.

4

Grow bioeconomy workforce skills

Establish skill development, education and training programs in key bioeconomy related sectors, including agriculture, biotechnology, biomanufacturing, engineering and related areas via expanding vocational training, industry apprenticeships, university pathways and post-graduate levels. Many of the skills required in adjacent industries are highly relevant to the bioeconomy workforce and the initial focus could be on expanding skills within the existing workforce. Regional workforce development should be prioritised to ensure skills availability in rural and regional areas.

5

Invest in bioeconomy research, development and translation

Bring together Australia's leading capability in research, industry and government through the establishment of a large-scale collaborative research program to drive advancements in technology development and deployment. Such a program could cover aspects including feedstock development, technology scale-up, consumer perceptions, market analysis and sustainability and economic assessment.

7. Conclusion: Building a Collaborative Future

The stakes are high - other countries are already capitalising on the opportunity presented by the bioeconomy, and now is the time for Australia to act, or risk losing the ability to compete in this rapidly growing global market.

By leveraging the nation's unique strengths, addressing critical challenges, and fostering strong collaboration among all stakeholders, Australia can build a thriving bioeconomy that delivers significant benefits across the economy, environment and society.

Through a strategic and coordinated approach, underpinned by a commitment to science and innovation, Australia has the potential not only to engage in but also to lead in advancing the global bioeconomy. This leadership will ensure a resilient, sustainable and prosperous future, securing long-term benefits for all Australians and positioning the nation as a global destination for bioeconomy development. The decisions made today will shape the future of Australia's bioeconomy. A unified effort is therefore essential to unlock the full potential of Australia's bioeconomy and to pave the way for a thriving, sustainable future.



World Bioeconomy Forum, & NatureFinance. (2024). Financing a Sustainable Global Bioeconomy.

