

Building Australia's biomanufacturing future – Lessons from international precedents

Executive Summary

Biomanufacturing is emerging globally as an important industrial capability for producing a wide range of high-value goods—including food ingredients, fuels, chemicals, materials, fertilisers and pharmaceuticals.

For Australia, this creates an opportunity not only to strengthen sovereign manufacturing and supply-chain resilience, but to create new sources of demand and value-add for agricultural industries and regional economies. Australia's sugar industry is particularly well placed to participate in this opportunity, providing high-quality biological feedstocks alongside established processing infrastructure, industrial capability and regional workforces.

Internationally, governments are increasingly treating the commercialisation of biotechnology as requiring deliberate national coordination. CAA's analysis identifies **25 national and regional biomanufacturing policy frameworks across 23 countries and two supranational regions**, including the EU, China, UK, India, South Korea and Japan. Many take a cross-sector approach, linking applications across food and agriculture, fuels, chemicals, materials and health. Leading jurisdictions are also pairing policy coordination with investment in shared pilot and demonstration infrastructure that enables technologies to progress from research into industrial production.

The United States and Europe provide particularly relevant examples. Europe has progressively connected strategy, public-private investment and a network of shared scale-up facilities. In the US, facilities and regional clusters such as the Illinois' iFAB Tech Hub have explicitly linked biomanufacturing with **agricultural value-add and regional development**.

The US BioMADE network is similarly developing facilities intended to convert domestic agricultural resources into higher-value food, chemical, material and other bioproducts—creating new markets for agricultural feedstocks alongside regional manufacturing capability.

Australia has many of the ingredients to pursue a similar opportunity, but an important gap remains. Australia has strong research and synthetic-biology capability and emerging scale-up assets, but companies continue to encounter a persistent “missing middle” between laboratory development and commercial production. Limited access to appropriate, repeatable and affordable pilot and demonstration-scale infrastructure means scaling offshore can become the rational option for Australian companies. Over time, this risks losing not only intellectual property, jobs and manufacturing investment, but the broader domestic supply chains and agricultural demand that commercial biomanufacturing could create.

For the **sugar industry, this connection is already visible in Mackay**. The QUT Pioneer BioPilot provides fermentation capacity of up to 2,400 litres and downstream processing capability across food, fuels, chemicals and other bioproducts. Its location alongside a major sugar manufacturer provides access to agricultural feedstocks and established industrial infrastructure—illustrating how existing sugar-producing regions could provide a foundation for larger place-based biomanufacturing ecosystems. International precedents suggest these clusters can create value beyond feedstock supply alone, combining agriculture with processing, technology development and higher-value regional manufacturing.

The paper therefore argues that Australia should build on existing investments rather than continue developing biomanufacturing capability through isolated, market-specific initiatives. Its proposed pathway is to:

1

Recognise biomanufacturing as a national resilience and security priority, including through assessment under the Future Made in Australia National Interest Framework.

Develop a National Biomanufacturing Security Strategy and cross-departmental Taskforce to coordinate policy, infrastructure and investment across food, fuels, chemicals, agriculture and other applications.

2

Expand and connect Australia's scale-up capability through National Biomanufacturing Production Hubs, building on existing assets and regional strengths such as Mackay and Toowoomba, while bringing together technology developers, facility operators, feedstock suppliers, offtakers and investors. Biomanufacturing projects should also be explicitly prioritised through the Commonwealth Investor Front Door and associated financing mechanisms.

3

As an additional near-term consideration, strengthen the feedstock and industrial base on which future biomanufacturing will depend.

The paper identifies a national ethanol mandate as one potential mechanism to create more durable demand for Australian sugarcane. In the paper's framing, near-term action to strengthen the sugar industry and longer-term growth in biomanufacturing are complementary: sustaining sugar-growing, milling and processing capability can help preserve strategically important feedstocks and infrastructure, while future biomanufacturing could create additional sources of demand and higher-value uses for Australian sugar.

The central lesson from international experience is that research excellence alone does not create domestic industrial capability. **Australia's opportunity is to connect its research strengths, agricultural resources and existing regional infrastructure into a coordinated pathway from innovation through scale-up to commercial production.** For sugar-producing regions, this presents a longer-term opportunity to participate in a more diversified bioeconomy—supporting new markets for agricultural feedstocks while anchoring higher-value manufacturing activity in regional Australia.



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