Circular Economy

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Contact

sustainability@jbsg.com.au
+61 8 8431 7113

jbsg.com.au/services/esg

Introduction

It is estimated that circular economy adoption could unlock AUD $6.5 trillion in economic growth through waste reduction, innovation, and new commercial models, while simultaneously cutting emissions, conserving water and soils, and reducing environmental liabilities.[1] Increasingly, circularity is also becoming a reporting requirement for regulators and investors.

Yet general understanding of the meaning and value of circular economy remains mixed.

Adopting circular practices can strengthen business performance and deliver tangible commercial benefits, including:

- Reduced material and energy costs
- New revenue opportunities (e.g. product-as-a-service, remanufacturing, by-product valorisation)
- Reduced exposure to resource scarcity and price volatility
- Enhanced competitiveness under emerging sustainability regulations (including AASB S2 and global supply-chain expectations.

In this paper, we outline the principles of a circular economy and demonstrate how circularity can improve your business performance while helping to respond to emerging legal and regulatory requirements.

What is Circular Economy?

A circular economy transforms how resources are designed, used, and recovered. Rather than following the traditional linear "take–make–dispose" model, it keeps products and materials circulating at their highest value for as long as possible.

Circular economy minimises waste, reduces environmental impact, and preserves the economic value embedded in materials and products.

Its foundational principles are (i) eliminating waste and pollution, (ii) keeping materials in circulation, and (iii) regenerating natural systems, opening new pathways for innovation and commercial growth.

Foundational Circular Economy principles

Eliminating waste and pollution

Keeping materials in circulation

Regenerating natural systems

[1] Peter Lacy & Jacob Rutqvist (2017). Waste to Wealth. *The Circular Economy Advantage*.

By emphasising durability, repairability, reuse, remanufacturing, and advanced recycling, circular design reduces reliance on virgin materials while creating opportunities for new markets, revenue streams, and business models that are better aligned with future economic and regulatory landscapes.

Modelling suggests that, in South Australia alone, a transition to a circular economy could generate approximately 25,700 additional full-time equivalent jobs by 2030 compared to a business-as-usual scenario.[2]

By integrating renewable energy and sustainable materials, a circular economy supports a more resilient and regenerative system that benefits businesses, communities, and the planet.

How circularity improves business performance

Businesses that optimise resource flows can significantly:

- **Lower input costs**
- **Mitigate risks from volatile resource markets**
- **Reduce waste management expenses**

Circular models are estimated to unlock:

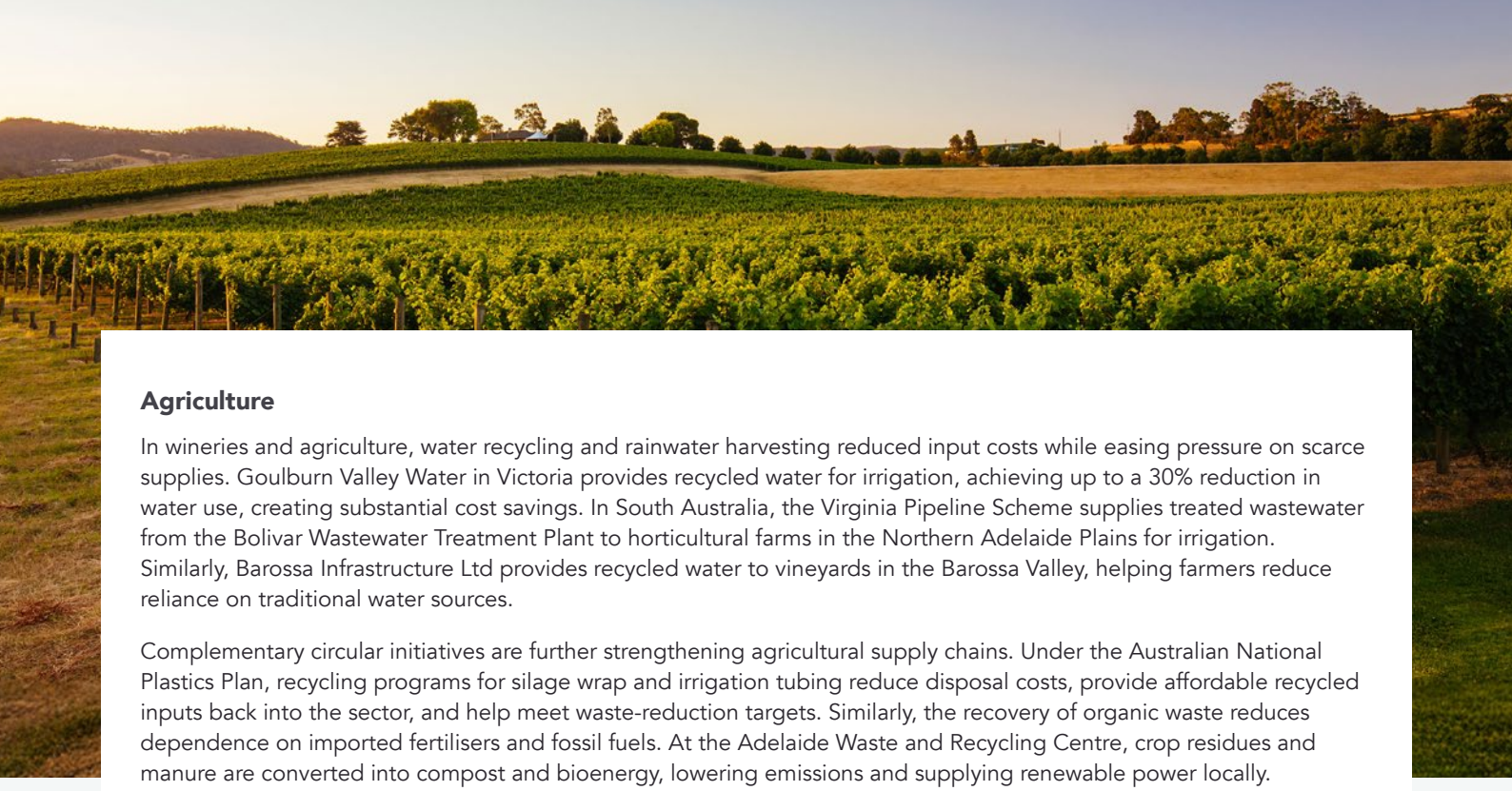
- 10–15% material cost savings
- 15–20% revenue growth through resale, repair, leasing, and reuse models

While also:

- Reducing exposure to resource scarcity and price volatility
- Unlocking new revenue streams
- Improving competitiveness under emerging sustainability regulations (e.g., AASB S2 and global supply-chain expectations).

With escalating global demand and increasing supply chain disruptions, particularly for critical raw materials essential to decarbonisation, digitalisation, and key manufacturing industries, companies that integrate circular strategies and localise operations can significantly **de-risk their operations**, shorten supply chains, **reduce dependence** on global markets, and **strengthen resilience** against volatility.

[2] Green Industries SA. '*Circular economy benefits*'. Visit: Economic Benefits of a Circular Economy for South Australia. Green Industries SA



Agriculture

In wineries and agriculture, water recycling and rainwater harvesting reduced input costs while easing pressure on scarce supplies. Goulburn Valley Water in Victoria provides recycled water for irrigation, achieving up to a 30% reduction in water use, creating substantial cost savings. In South Australia, the Virginia Pipeline Scheme supplies treated wastewater from the Bolivar Wastewater Treatment Plant to horticultural farms in the Northern Adelaide Plains for irrigation. Similarly, Barossa Infrastructure Ltd provides recycled water to vineyards in the Barossa Valley, helping farmers reduce reliance on traditional water sources.

Complementary circular initiatives are further strengthening agricultural supply chains. Under the Australian National Plastics Plan, recycling programs for silage wrap and irrigation tubing reduce disposal costs, provide affordable recycled inputs back into the sector, and help meet waste-reduction targets. Similarly, the recovery of organic waste reduces dependence on imported fertilisers and fossil fuels. At the Adelaide Waste and Recycling Centre, crop residues and manure are converted into compost and bioenergy, lowering emissions and supplying renewable power locally.

Renewable infrastructure

Recycled materials in the construction of wind turbines and solar panels reduce costs and resource consumption. The Clean Energy Council of Australia has reported that utilising recycled metals and materials in renewable energy systems can lower production costs by up to 15%, while local production and maintenance of these systems create jobs and stimulate economic growth, reducing dependence on external energy sources[3]. A greater self-sufficiency can lessen dependence on imported materials and stabilise supply chains. This reduces vulnerability to global market fluctuations and ensures a more predictable and affordable supply of essential materials.

Mining

Mining is also beginning to capture circular value from materials traditionally treated as waste. Re-processing tailings to recover residual minerals creates new revenue streams while reducing long-term rehabilitation liabilities. By selling by-products such as aggregate from waste rock, recovered metals and critical minerals, and industrial minerals for use in construction and manufacturing, companies can lower disposal costs and diversify income. Designing equipment and components for reuse and refurbishment further reduces maintenance expenses and exposure to volatile commodity prices.

Major mining companies are already integrating secondary mineral recycling into their operations. Glencore operates one of the world's largest metals recycling businesses, recovering copper, nickel, cobalt, zinc and precious metals from end-of-life electronics and batteries through facilities such as the Horne Smelter in Canada. Rio Tinto has expanded into secondary aluminium through its 50% stake in Matalco, a major recycled aluminium producer, supporting low-carbon material supply and closed-loop manufacturing. Recycled lithium, for example, requires 90% less energy than extracting virgin lithium.[4]

[3] Clean Energy Council (2020). *Clean Energy Report Australia Report 2020.*

[4] Ellen Macarthur Foundation (2025). 'Exploring the circular economy opportunity for critical minerals'. Visit: EllenMacArthurFoundation

Staying ahead of evolving compliance requirements

Adopting circular-economy strategies is also increasingly becoming a matter of regulatory compliance and risk management. By embracing circularity, companies can stay ahead of compliance demands, avoid fines or penalties, and reduce exposure to shifting regulations.

Across Australia, businesses already face a growing web of legal oblidations, regulations, as well as policies and frameworks at both the national and state levels, including:

- National Circular Economy Framework 2024
- National Waste Policy and Action Plan 2024
- National Recycling and Waste Reduction Act 2020
- The Product Lifecycle Responsibility Act 2025 (NSW)
- The Single-Use Plastic (Waste Avoidance) Act 2020 (SA)

As well as:

- Mandatory stewardship schemes
- Container-deposit/refund schemes
- State-level waste levies
- Export bans on certain waste streams

The National Circular Economy Framework 2024, for example, formalises a shift away from end-of-life waste management toward whole-of-life responsibility. This requires businesses to consider product design, material sourcing, durability, reuse, repair, and recovery as part of core operations. Importantly, the Framework is intended to be operationalised through existing regulatory and market levers, particularly government procurement. As public-sector buyers increasingly align tender processes with circular-economy objectives, businesses are expected to demonstrate measurable sustainability and circular-economy performance as a condition of market access. This includes meeting minimum circularity thresholds, reporting against circular-economy metrics (such as recycled content, waste diversion, take-back arrangements, and whole-of-life impacts), and embedding circular commitments into contracts.

As a result, suppliers that can credibly evidence circular practices are more likely to be prioritised in government tenders, while those that do not, may face rising compliance risks, reduced competitiveness, and potential exclusion from public-sector supply chains.

> By embracing circularity, companies can stay ahead of compliance demands, avoid fines or penalties, and reduce exposure to shifting regulations. Meanwhile, market pressures are increasing. Consumers expect environmentally responsible sourcing and operations, investors demand transparent carbon and supply-chain disclosures, and reporting obligations like AASB S2 Climate-related Disclosures require businesses to measure and reduce emissions across their supply chains.

In the mining sector for example, circular economy and waste reduction principles are embedded in existing legal requirements for approvals. Environmental Impact Assessments, Environmental Authorities, and Mine Closure Plans require companies to manage resources efficiently, minimise waste, and plan for rehabilitation and material reuse. Mining companies that integrate these circularity-aligned practices into project design and operations are better positioned to meet regulatory obligations, reduce environmental risks, and gain a competitive advantage in securing approvals. In this context, continuing with linear, high-waste operating models becomes a financial and compliance risk.

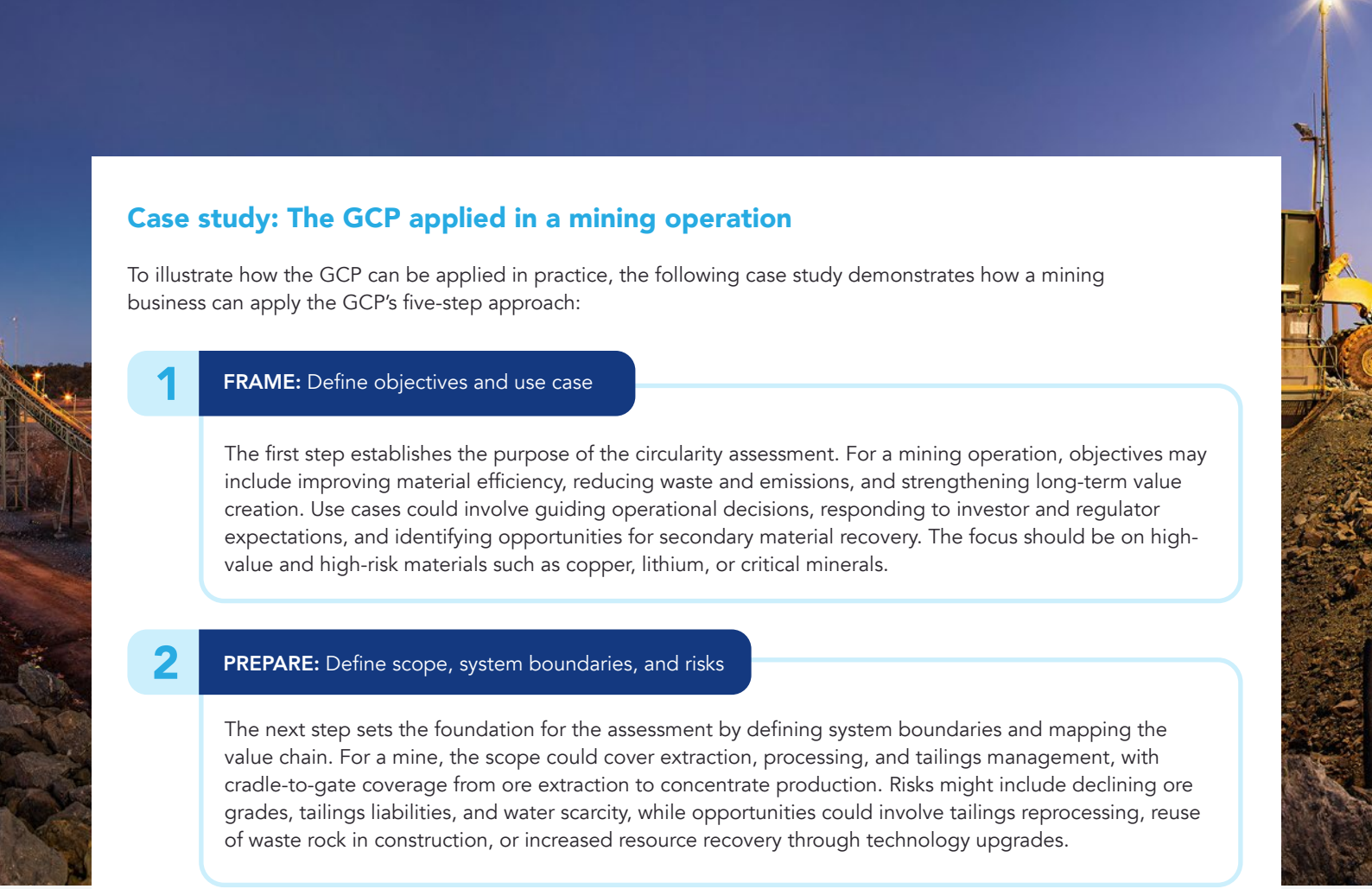
The Global Circularity Protocol for Business

The Global Circularity Protocol for Business (GCP) is a globally recognised framework for measuring, assessing, and reporting circular economy performance. It provides a common language and methodology, supporting credibility, comparability, and decision-useful insights across sectors. Structured reporting helps businesses benchmark performance, compare with peers, and access green financing or bonds.

The GCP can be applied at different scales and maturity levels. The three phases are (i) *Initiation*, (ii) *Expansion*, and (iii) *Consolidation*. This staged approach allows organisations to start with foundational elements and scale up as data, expertise, and experience improve. A key early step to start applying the GCP is defining the assessment scope within the business. The assessment can be applied at material-level, asset/product-level, or organisation-wide.

The GCP follows a **five-step** approach:

1. **FRAME** objectives and use case
2. **PREPARE** by defining boundaries, mapping value chains, and identifying risks/opportunities
3. **MEASURE** circular performance using selected indicators
4. **MANAGE** results by analysing findings and integrating them into decisions
5. **COMMUNICATE** outcomes through transparent, consistent reporting to stakeholders



Case study: The GCP applied in a mining operation

To illustrate how the GCP can be applied in practice, the following case study demonstrates how a mining business can apply the GCP's five-step approach:

1 **FRAME:** Define objectives and use case

The first step establishes the purpose of the circularity assessment. For a mining operation, objectives may include improving material efficiency, reducing waste and emissions, and strengthening long-term value creation. Use cases could involve guiding operational decisions, responding to investor and regulator expectations, and identifying opportunities for secondary material recovery. The focus should be on high-value and high-risk materials such as copper, lithium, or critical minerals.

2 **PREPARE:** Define scope, system boundaries, and risks

The next step sets the foundation for the assessment by defining system boundaries and mapping the value chain. For a mine, the scope could cover extraction, processing, and tailings management, with cradle-to-gate coverage from ore extraction to concentrate production. Risks might include declining ore grades, tailings liabilities, and water scarcity, while opportunities could involve tailings reprocessing, reuse of waste rock in construction, or increased resource recovery through technology upgrades.

3 **MEASURE:** Quantify circular performance

Circularity is measured using indicators relevant to mining. Examples include:

- Material flows: Recovery rates, material intensity, and percentage of secondary inputs.
- Waste and tailings: Tailings generation per tonne of output and reuse rates.
- Resource efficiency: Water recycling and energy intensity.
- Risk-linked metrics: Legacy tailings volumes and dependence on critical inputs.

Data is sourced from production reports, environmental monitoring, and supplier information.

4 **MANAGE:** Analyse and integrate findings

Assessment results are analysed to identify inefficiencies and potential interventions. Mines can integrate findings into operational decisions, such as investing in recovery-enhancing technologies, redesigning tailings strategies, or adjusting mine planning to reduce waste. Circularity metrics are embedded into KPIs, risk management, and strategic planning, with clear governance assigned to operations, sustainability, and strategy teams.

5 **COMMUNICATE:** Report and disclose outcomes

Finally, outcomes are communicated both internally and externally. Internally, dashboards and executive reports inform operational and strategic decisions. Externally, sustainability or integrated reports showcase circular practices, quantifying reductions in waste, water use, and emissions. Communication aligns with reporting frameworks such as GRI, ISSB, and TNFD, highlighting how circularity strengthens resilience, reduces liabilities, and creates long-term value.

First steps for getting started

Businesses can start their circular economy journey by following these three steps:

1. Set clear, measurable goals for a circular transition

- Define quantitative goals that deliver both environmental and financial outcomes.
- Use clear metrics and timelines to track progress, prioritise interventions, and ensure accountability across the organisation.

2. Integrate circular economy principles into operations

- Embed circularity through operational and asset design to maximise resource efficiency and material lifespan.
- Design facilities and processes for easier reuse, adopting modular or refurbishable equipment, and implementing systems that enable material recovery and by-product valorisation.

3. Collaborate across the value chain to drive resource efficiency and innovation

- Work with suppliers, partners, and downstream users to recover materials, refurbish equipment, and improve water and energy efficiency.
- Participate in joint industry initiatives, such as shared processing or by-product recycling, to reduce costs and create new revenue streams.

How JBS&G can help

JBS&G helps businesses integrate circular economy practices through a range of strategic and operational services. This includes applying the Global Circularity Protocol for Businesses to benchmark performance, identify high-impact opportunities, and provide transparent reporting to track progress.

We work flexibly with your team to apply circular approaches where they deliver the most impact, supporting your business to save costs, reduce risk, and stay competitive. Our lifecycle and waste-to-value analytics reveal where materials and emissions can be eliminated or repurposed, unlocking both carbon and cost savings.

Services include but are not limited to:

Optimising Resource Use in Operations

- Material flow analyses to identify key waste hotspots and opportunities for efficiency improvements.
- Strategies for integrating secondary materials, such as recycled or reclaimed inputs, into production processes.
- Guidance to reduce energy consumption and potential pathways to transition towards renewable energy sources.

Improving Waste Management Roadmap

- Support of design of closed-loop recycling systems within facilities to enhance material circularity.
- Investigation of partnership opportunities with recycling organisations or innovators to ensure end-of-life materials can re-enter the value chain.
- Recommendations on industrial symbiosis initiatives, where byproducts from one company could serve as feedstock for another.

Sam Hardy
ESG and Sustainability Lead
shardy@jbsg.com.au
0456 714 622

Vera Storp
Associate, ESG and Sustainability
vstorp@jbsg.com.au
0487 868 528