



# CIRCULAR ECONOMY

## Accelerating sustainability through resource efficiency & circular innovation

*In the global transition towards sustainable resource management, the circular economy is set to play a critical role in REDUCING WASTE and MAXIMISING RESOURCE EFFICIENCY. A circular economy minimises environmental impact by keeping materials in use, reducing waste, and regenerating natural systems.*

### IN BRIEF:

- The circular economy aims to minimise waste and maximise resource use, promoting recycling, reuse, and regeneration to support sustainability and mitigate environmental challenges.
- Australia's first Circular Economy Framework, launched in December 2024, targets a 10% reduction in material footprint, 30% increase in productivity, and 80% resource recovery, unlocking A\$26 billion each year in economic value.
- Key industries like manufacturing, construction, and agriculture are adopting circular practices, creating significant environmental and economic benefits, with projections of A\$210 billion GDP growth by 2048.
- Innovations such as AI, blockchain, and advanced recycling technologies are driving Australia's circular transition.

The circular economy is an economic model aimed at minimising waste and pollution and making the most of resources. Unlike the traditional linear economy which follows a 'take, make, dispose' approach the circular economy emphasises designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.<sup>1</sup>

This model seeks to create a closed loop system where resource input, waste, emissions, and energy leakage are minimised through long-lasting design, maintenance, repair, reuse, re-manufacturing, refurbishing, and recycling.

The circular economy is guided by 3 core principles<sup>2</sup>;

- Keeping products and materials in use and at highest value through reuse, repair, refurbishing and re-manufacturing.
- Designing out waste and pollution.
- Regenerating natural systems.

Embracing a circular economy not only conserves finite resources but also fosters economic resilience and innovation. By shifting from a linear to a regenerative model, industries can reduce environmental impact while creating new business opportunities. This transition is increasingly gaining traction worldwide, with governments and corporations recognising its long-term benefits.

<sup>1&2</sup>DCEEW (2024). The Circular Advantage. <https://www.dceew.gov.au/sites/default/files/documents/circular-advantage-final-report-cemag.pdf>.

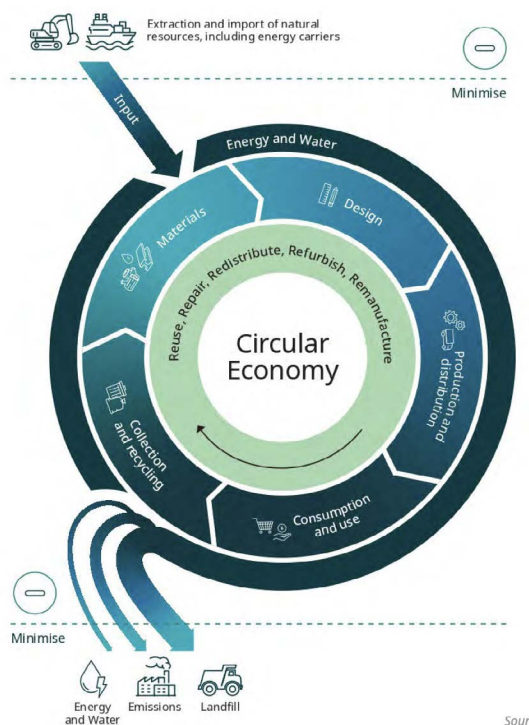


EXHIBIT 1: THE CIRCULAR ECONOMY, WHERE RESOURCES ARE KEPT IN CIRCULATION- INPUTS & WASTE ARE MINIMISED, DCCEEW (2024)

### CIRCULAR ECONOMY IN GLOBAL ECONOMY

Today, the circular economy is increasingly recognised as a viable solution to pressing global challenges, including resource scarcity, environmental degradation, and economic instability. By decoupling economic growth from resource consumption, the circular economy offers a pathway to sustainable development. For instance, a 2020 KPMG report found that adopting circular practices in sectors like food, transport, and the built environment could add an extra A\$23 billion to Australia’s GDP by 2025.<sup>3</sup>

Moreover, the circular economy is becoming a focal point for policy development worldwide. Governments are implementing strategies & regulations to promote circularity, recognising its potential to drive innovation, create jobs, and achieve environmental targets. Read more on page 3.

EXHIBIT 2: GLOBAL CIRCULARITY RATES, DCCEEW (2024)

Country	Circularity	Circularity Goal	Trade balance*
USA	-	-	-
China	-	-	-
Japan	-	-	-
Finland	0.6%	Double between 2015 and 2035	Materials exporter (-0.09)
Norway	2.4%	-	Materials exporter (-0.09)
Ireland	2.7%	-	Materials importer (0.25)
<b>Australia</b>	4.6%	Double between 2024 and 2035	Materials exporter (-0.53)
Sweden	6.1%	-	Materials exporter (-0.08)
<b>Global avg</b>	7.2%	-	Neutral (0.0)
Denmark	7.4%	-	Materials importer (0.23)
UK	7.5%	-	Materials importer (0.29)
N Ireland	7.9%	-	Materials importer (0.25)
EU	11.5%	Double between 2020 and 2030	-
Italy	18.7%	Reach 24% by 2040	Materials importer (0.12)
Netherlands	27.5%	Fully circular by 2050	Materials importer (0.28)

\*Physical trade balance (i.e., imports minus exports) divided by domestic extraction. Countries that are net exporters of resources have increasingly negative scores. Data generated from the International Resource Panel 2019 statistics.

### ALIGNMENT WITH SUSTAINABILITY & NET-ZERO GOALS

The circular economy is closely aligned with sustainability objectives and the pursuit of net-zero greenhouse gas emissions. By promoting resource efficiency and waste reduction, circular practices can significantly lower carbon footprints.

Implementing circular economy strategies can also contribute to achieving net-zero goals by transforming production and consumption patterns. By designing products for longevity, facilitating repair and reuse, and creating systems for material recovery, the circular economy reduces reliance on materials and fossil fuels, thereby lowering greenhouse gas emissions. This systemic approach supports global efforts to mitigate climate change and promotes sustainable economic growth.<sup>4</sup>

“Circular economy should be seen as an instrument helping delivering decoupling of economic growth from resource use and environmental impacts in practice, as well as a part of the bigger picture of economic, societal and cultural transformation needed to deliver the SDGs” says Janez Potočnik, former European Commissioner for Environment, Co-Chair International Resource Panel.

### MARKET DYNAMICS

Australia’s transition to a circular economy presents significant economic opportunities, with potential benefits across various sectors. Looking ahead, a report published by KPMG projects a present value GDP increase of A\$210 billion by 2047-48, along with the creation of an additional 17,000 full-time equivalent jobs.<sup>5</sup>

Despite these prospects, Australia’s current circularity rate remains low. CSIRO states that only 4% of materials in the Australian economy are reused or recycled, which is half the global average of 8%. This indicates substantial room for improvement in resource efficiency and waste reduction.<sup>6</sup>

Recognising the need for advancement, the Australian government has introduced initiatives to enhance circularity. In late 2022 the Minister for the Environment and Water, Tanya Plibersek, announced the formation of a Circular Ministerial Advisory Group. It delivered its final report, The Circular Advantage, with a number of recommendations including the development of a National Circular Economy Policy Framework. In December 2024, Minister Plibersek unveiled Australia’s Circular Economy Framework aiming to double the nation’s circularity rate.

The framework sets targets to reduce Australia’s material footprint by 10%, increase material

<sup>3</sup>RMIT Online (2024). The circular economy. Rmit.edu.au. <https://online.rmit.edu.au/blog/circular-economy>

<sup>4</sup>National Institute of Building Sciences (2024). The Circular Economy Overview. [https://www.nibs.org/sites/default/files/pdfs/The-Circular-Economy\\_Summary.pdf](https://www.nibs.org/sites/default/files/pdfs/The-Circular-Economy_Summary.pdf).

<sup>5</sup>Rynne, B. (2020). Potential economic pay-off of a circular economy for Australia - KPMG Australia. KPMG. <https://kpmg.com/au/en/home/insights/2020/05/potential-economic-pay-off-circular-economy-australia.html>.

<sup>6</sup>CSIRO (2024). New report reveals Australia’s material use and circular rate. [www.csiro.au. https://www.csiro.au/en/news/All/News/2024/March/New-report-reveals-Australias-material-use-and-circular-rate](https://www.csiro.au/en/news/All/News/2024/March/New-report-reveals-Australias-material-use-and-circular-rate).

productivity by 30%, and recover 80% of resources. Achieving these goals could divert 26 million tonnes of waste from landfills annually and reduce greenhouse gas emissions by 14%.<sup>7</sup>

“Australia’s strong policy direction, including the new Circular Economy Framework, is paving the way for a more resource-efficient economy. Important Government funding initiatives such as the National Reconstruction Fund, the Recycling Modernisation Fund and the Northern Australia Investment Fund demonstrate their commitment to accelerating circular business models and infrastructure investment at scale.” says Paul Klymenko, co-founder Australian Ethical Super, co-founder of Planet Ark and a Member of Circular Economy Ministerial Advisory Group for the Australian Government. Paul was a contributor to the Circular Advantage Report which was the key influence for the creation of Australia’s Circular Economy Framework.

To capitalise on these opportunities, Australia can leverage its comparative advantages in sectors such as mining, construction, manufacturing, agriculture, and resource recovery. A 2024 report by CSIRO highlights that focusing on these industries could unlock vast economic value while reversing the substantial loss of natural capital. The report emphasises the importance of innovation, workforce development, and supportive policy frameworks in driving the transition to a more circular economy.<sup>8</sup>

**AUSTRALIA'S TARGETS**

Countries can adopt two complementary strategies to enhance their circularity and transition toward a sustainable economy.

First, they can focus on reducing material consumption by prioritising the use of materials that are recycled and recyclable and investing in renewable energy, durable goods as infrastructure, remanufacture, repair and shared product and mobility solutions. This approach minimises reliance on non-recyclable resources and reduces waste generation.<sup>9</sup>

Second, countries can work toward achieving their circularity potential by ensuring that materials, once used, are efficiently recovered and reintroduced into the economic cycle, thereby enhancing resource

productivity and reducing environmental impact.<sup>10</sup>

**Target 1; Reducing Material Footprint by 10%**

Material footprint measures the total volume of materials consumed to produce goods & services used within the economy. At 31 tonnes per capita, Australia has the highest material footprint among G20 nations, underscoring the need for significant change.

Since material footprint is a key driver of greenhouse gas emissions, retaining materials in circulation for longer periods and optimising their use represent critical opportunities to reduce Australia’s carbon footprint. Achieving this target will involve adopting circular economy practices such as improved design and material selection in the built environment, alongside incorporating longer lasting and recycled materials in manufacturing processes.<sup>11</sup>

**Target 2; Increasing Materials Productivity by 30%**

Materials productivity evaluates how efficiently raw materials like minerals, metals, and biomass are utilised in production. It is typically expressed as the ratio of economic output to material consumption.

With a current rate of US\$1.20 of economic output per kilogram of material used – significantly lower than the OECD average of US\$2.50 – Australia has considerable scope for improvement. Scaling innovation, advancing domestic manufacturing capabilities, and fostering cross-supply chain collaborations will be pivotal in achieving this goal.

“ADOPTING  
CIRCULAR  
ECONOMY  
PRACTICES WILL  
INCREASE GDP BY  
A\$210 BILLION IN  
2047-48, & CREATE  
17,000 JOBS”

KPMG

Additionally, promoting the domestic reuse of recycled materials will not only increase productivity but also reduce material waste and bolster environmental outcomes.<sup>12</sup>

**Target 3 Safely Recovering 80% of Resources**

Australia currently recovers approximately 63% of its resources, while the remaining materials, valued at A\$26.5 billion annually, are sent to landfills at a significant cost of A\$1.4 billion.

Achieving an 80% recovery rate will require upstream interventions, such as designing products that are easier to disassemble, recycle, or repurpose at the end of their lifecycle. Removing harmful chemicals that obstruct safe recycling and enabling materials substitution through innovation will also be crucial. Furthermore, building robust markets

<sup>7</sup>England, C. (2024). The circular economy could be an economic boon, but Australia is lagging in its efforts to date. <https://www.theaustralian.com.au/business/renewable-energy-economy/the-circular-economy-could-be-an-economic-boon-but-australia-is-lagging-in-its-efforts-to-date/news-story/86ff5a753f23e0224cac04afc79f93f>.

<sup>8</sup>CSIRO (2024). New report reveals Australia’s material use and circular rate. <https://www.csiro.au/en/news/All/News/2024/March/New-report-reveals-Australias-material-use-and-circular-rate>.

<sup>9-12</sup>DCEEW (2024). Australia’s Circular Economy Framework. <https://www.dceew.gov.au/sites/default/files/documents/australias-circular-economy-framework.pdf>. <sup>11</sup>Tylenda, E., Meyer, M., Chen, G., Fraser, G., Patel, A., Singer, B., Bingham, D. and Chetwode, S. (2022). The evolution towards a Circular Economy. <https://www.goldmansachs.com/pdfs/insights/pages/gs-research/gs-sustain-circular-economy/report.pdf>.

for recovered resources and accelerating innovative applications for these materials will be key to achieving this target while generating economic value and strengthening supply chain resilience.<sup>13</sup>

### MARKET GROWTH

The circular economy is poised to significantly impact global economic growth in the coming decades. Goldman Sachs projects that transitioning to a circular economy could contribute an additional US\$4.5 trillion to global economic output by 2030, expanding to US\$25 trillion by 2050. This substantial growth underscores the economic potential of adopting circular practices worldwide.<sup>14</sup>

In Europe, the shift towards a circular economy presents notable economic advantages. A report indicates that such a transition could increase Europe’s resource productivity by up to 3% annually, leading to cost savings of €600 billion per year by 2030. Additionally, this move could generate €1.2 trillion in non-resource and externality benefits, culminating in a total annual benefit of approximately €1.8 trillion. This would translate into a GDP increase of up to 7% relative to the current development scenario, highlighting the significant economic incentives for European nations to embrace circularity. Despite the promising economic projections, global circularity has been on a decline.

Boston Consulting Group notes that only 7.2% of

materials produced in 2023 originated from circular sources, a decrease from 9.1% in 2018. This trend emphasises the need for accelerated efforts to adopt circular practices to realise the projected economic benefits.<sup>15</sup>

### KEY DRIVERS

#### Regulatory Push Towards Sustainability

Governments worldwide are implementing stringent regulations to promote sustainable practices and reduce environmental impact including circular economy policy, legislation & supporting funding initiatives. For instance, the European Union’s Circular Economy Action Plan aims to make sustainable products the norm in the EU, focusing on areas such as electronics, batteries, and packaging.

This plan is part of the broader European Green Deal, which seeks to achieve climate neutrality by 2050. The European Investment Bank (EIB) supports this transition by providing financing and advisory support for circular economy projects, having co-financed 132 such projects with €3.83 billion from 2019 to 2023.<sup>16</sup>

#### Consumer Demand for Sustainable Products

Consumer preferences are increasingly shifting towards sustainable and ethically produced goods. A report by Deloitte highlights that over 70% of global organisations have yet to implement a circular economy initiative, indicating significant potential

EXHIBIT 3: THE SIX KEY ELEMENTS THAT AUSTRALIA MUST FOCUS ON TO ENABLE CIRCULAR ECONOMY, CSIRO (2024)



<sup>13</sup>Feth, M., Pieper, C., Lee, J., Jindal, G., Feng, T., Knowles, S. and Valluru, K. (2024). Circularity’s Time Has Come. BCG Global. <https://www.bcg.com/publications/2024/circularitys-time-has-come?linkId=577028652>.

<sup>14</sup>European Investment Bank (2024). Circular economy Overview. [https://www.eib.org/attachments/lucalli/20240104\\_circular\\_economy\\_overview\\_2024\\_en.pdf](https://www.eib.org/attachments/lucalli/20240104_circular_economy_overview_2024_en.pdf).

<sup>15</sup>Deloitte (2024). CGR 2024. <https://www.circularity-gap.world/2024>.

<sup>16</sup>World Economic Forum (2025). Circular Transformation of Industries: Unlocking Economic Value. [https://reports.weforum.org/docs/WEF\\_Circular\\_Transformation\\_of\\_Industries\\_2025.pdf](https://reports.weforum.org/docs/WEF_Circular_Transformation_of_Industries_2025.pdf).

<sup>17</sup>McKinsey (2015). Europe’s circular-economy opportunity. <https://www.mckinsey.com/capabilities/sustainability/our-insights/europes-circular-economy-opportunity>.

to meet growing consumer demand for sustainable products.

This consumer-driven trend is encouraging companies to adopt circular practices to maintain competitiveness and brand loyalty.<sup>17</sup>

### Resource Scarcity and Cost-Saving Benefits

The depletion of natural resources and the volatility of raw material prices are compelling businesses to seek alternative models. Adopting circular economy principles allows companies to reduce dependency on various materials, thereby mitigating risks associated with resource scarcity. Additionally, circular practices such as recycling, remanufacturing, and extending product life cycles can lead to significant cost savings.

The World Economic Forum emphasises that circular transformation can unlock economic value by reducing material costs and creating new revenue streams.<sup>18</sup>

### CHALLENGES

Transitioning to a circular economy presents several challenges, including implementation costs, technological barriers, and limited awareness and collaboration across sectors. Addressing these challenges is crucial for realising the full potential of circular economic models.

### Implementation Costs

Adopting circular economy principles often requires significant upfront investments. Companies may need to redesign products, revamp manufacturing processes, and establish new supply chain mechanisms to facilitate recycling and reuse.

According to a McKinsey report, the transition to a circular economy would involve considerable costs, such as R&D and asset investments, subsidy payments to promote market penetration of new products, and public expenditure for digital infrastructure.<sup>19</sup>

These expenses can be particularly burdensome for small and medium-sized enterprises (SMEs) that may lack the necessary capital.

### Technological Barriers

Implementing circular practices necessitates advanced technologies for efficient recycling, remanufacturing, and resource recovery.

However, technological limitations can impede progress. For instance, the lack of sophisticated sorting and processing solutions can make recycling processes inefficient or economically unviable. A report by Boston Consulting Group highlights that technical barriers, such as scarce sorting or processing solutions, pose significant challenges to circularity.<sup>20</sup>

Overcoming these barriers requires substantial investment in research and development to innovate and scale appropriate technologies.

### Limited Awareness & Collaboration Across Sectors

Achieving a circular economy demands a systemic shift involving multiple stakeholders across various industries. However, limited awareness and insufficient collaboration hinder this transition. Many businesses and consumers remain unaware of the benefits and practices associated with circularity. Moreover, cross-sector collaboration is essential to create closed-loop systems, yet such partnerships are often lacking.

The Platform for Accelerating the Circular Economy (PACE), created by the World Economic Forum and now hosted by the World Resources Institute, emphasises the need for deep cross-sector collaboration to overcome these challenges.<sup>21</sup>

To help overcome these barriers in Australia, Planet Ark, with the assistance of Commonwealth Government funding, launched the Australian Circular Economy (ACE) Hub, which now has over 2,500 companies and individuals participating on its ACE Hub Portal.

Enhancing education and fostering partnerships through initiatives like this are vital steps toward a more circular economy.

### KEY INDUSTRIES ADOPTING CIRCULAR PRACTICES

The transition to a circular economy is gaining momentum across various industries, driven by the need to enhance resource efficiency, reduce environmental impact, and comply with evolving regulations. Notably, sectors such as manufacturing, consumer goods, construction, and energy are at the forefront of adopting circular practices.

**“REACHING NET ZERO BY 2050 WILL REQUIRE ABOUT SIX TIMES TODAY’S CRITICAL MINERAL USE IN 2040”**

*Janez Potočnik, former European Commissioner for Environment*

### Manufacturing: Automotive, Electronics, & Textiles

In the automotive industry, companies are

<sup>17</sup>Feth, M., Pieper, C., Lee, J., Jindal, G., Feng, T., Knowles, S. and Valluru, K. (2024). Circularity's Time Has Come. BCG Global. <https://www.bcg.com/publications/2024/circularity-time-has-come?linkId=577028652>.

<sup>18</sup>Hughes, K. and Betti, F. (2023). This is how we turn more industries into circular economies. World Economic Forum. <https://www.weforum.org/stories/2023/01/industry-circular-economy-change/>.

<sup>19</sup>Allen, I. and Walrecht, A. (2024). From talk to action: Paving the way for a circular economy in the consumer goods and retail industry. KPMG. <https://kpmg.com/xx/en/our-insights/esg/from-talk-to-action-paving-the-way-for-a-circular-economy-in-the-consumer-goods-and-retail-industry.html>.

<sup>20</sup>World Economic Forum (2025). Circular Transformation of Industries: Unlocking Economic Value. [https://reports.weforum.org/docs/WEF\\_Circular\\_Transformation\\_of\\_Industries\\_2025.pdf](https://reports.weforum.org/docs/WEF_Circular_Transformation_of_Industries_2025.pdf).

increasingly embracing circularity by designing vehicles for longer lifespans and facilitating the reuse and recycling of components. For instance, the European Union’s Circular Economy Action Plan includes measures to ensure that vehicles are designed to be more durable and easier to dismantle, promoting the reuse of parts and materials.

This approach not only reduces waste but also decreases the demand for raw materials, contributing to environmental sustainability.<sup>22</sup>

The electronics sector is also making strides toward circularity. Companies are developing products with modular designs, allowing for easier repairs and upgrades, thereby extending product lifespans. Additionally, take-back programs are being implemented to recover valuable materials from end-of-life electronics.

According to the World Economic Forum, such initiatives are crucial for reducing electronic waste and conserving resources.

In the textiles industry, there is a growing emphasis on sustainable materials and recycling. Fashion companies are adopting practices such as using recycled fibers and implementing clothing take-back schemes to reduce textile waste.

The World Economic Forum highlights that these efforts not only mitigate environmental impact but also open new avenues for economic value creation.<sup>23</sup>

#### Consumer Goods: FMCG & Packaging

Fast-Moving Consumer Goods (FMCG) companies are increasingly focusing on circular economy principles to enhance sustainability. This includes redesigning packaging to be more recyclable or compostable and reducing single-use plastics.

KPMG reports that the consumer goods and retail industry is making progress toward circularity, with companies setting ambitious goals and collaborating across the value chain to implement sustainable practices.<sup>24</sup>

#### Construction & Infrastructure

The construction industry is adopting circular practices by utilising recycled materials and designing buildings for disassembly and reuse. This approach not only reduces waste but also conserves resources and lowers carbon emissions.

#### Energy & Waste Management

In the energy sector, circularity is promoted through the recovery and reuse of waste materials. For example, anaerobic digestion waste-to-energy plants convert waste streams such as food and other biosolids into renewable electricity and fertiliser reducing landfill and associated greenhouse gas emissions .

The World Economic Forum highlights that such practices not only address waste management challenges but also contribute to energy security and sustainability.<sup>25</sup>

Waste management companies are rapidly evolving from traditional disposal services to resource recovery enterprises. By investing in advanced sorting and recycling technologies, these companies can extract valuable materials from waste streams, contributing to a more circular economy.

“Reaching net zero by 2050 will require about six times today’s critical mineral use in 2040. And even meeting today’s under-ambitious national climate plans would require more than doubling of critical minerals we are using today” says Janez Potočnik.

## “INTERGRATION OF AI, IOT & BLOCKCHAIN IS SIGNIFICANTLY ENHANCING CIRCULAR ECONOMY PRACTICES”

KPMG

#### INNOVATION IN CIRCULAR ECONOMY

Innovation is pivotal in advancing Australia’s recycling, remanufacturing, and resource recovery sectors, driving the nation towards a more sustainable circular

economy. The CSIRO has been at the forefront of this movement, developing technologies such as the “recycling robo-bin.” This intelligent system utilises advanced sensors and artificial intelligence to accurately sort recyclable materials, significantly reducing contamination rates and improving the efficiency of recycling processes.

CSIRO’s 2021 Circular Economy Roadmap indicates that such innovations could triple job creation in resource recovery by fostering new product designs, advanced manufacturing techniques, and novel business models, thereby creating both domestic and export markets for waste streams.<sup>26</sup>

#### TECHNOLOGIES DRIVING THE CIRCULAR ECONOMY

**Advanced Recycling Technologies:** Innovations in recycling processes, such as chemical recycling, enable the breakdown of complex plastics into their

<sup>22</sup>CSIRO (2022). Recycling robo-bin among innovations to solve circular economy gap. <https://www.csiro.au/en/news/All/News/2022/August/Recycling-robo-bin-among-innovations-to-solve-circular-economy-gap>.

<sup>23</sup>KPMG. (2023). Advanced industrial manufacturing supporting a circular economy <https://kpmg.com/au/en/home/insights/2023/10/industry-4-0-industrial-manufacturing-circular-economy.html>.

<sup>24</sup>Lynch, J. (2024). Samsara Eco strikes recycling ‘breakthrough’. <https://www.theaustralian.com.au/business/technology/samsara-eco-strikes-recycling-breakthrough-turning-more-plastics-into-clothes/news-story/b14f383e98ba3e3fbc636cf9a2708ed3>.

<sup>25</sup>Ross, A. (2025). Can sustainable investing survive Trump 2.0? Financial Times. <https://www.ft.com/content/14ce5968-79de-42bf-80a4-811531e80de7>.

original monomers, allowing for the production of new plastics without degradation in quality.

These technologies enhance the recyclability of materials that were previously considered non-recyclable, thereby reducing waste and conserving resources.

**Material Innovation:** The development of biodegradable and bio-based materials offers sustainable alternatives to traditional plastics. For instance, bioplastics derived from agricultural waste not only reduce dependence on fossil fuels but also integrate seamlessly into existing recycling systems, thereby supporting the transition to a circular economy.

### Digital Technologies Enhancing Circular Practices in Australia

The integration of digital technologies like Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain is enhancing circular economy practices across Australia. KPMG Australia highlights that Industry 4.0 technologies, including IoT & data analytics, can support sustainable manufacturing by improving operational efficiency and enabling predictive maintenance. For example, IoT devices can monitor machinery in real-time, predicting failures before they occur, thus reducing downtime and extending equipment lifespan.<sup>27</sup>

Additionally, blockchain technology can provide end-to-end tracking and tracing of materials throughout the supply chain, ensuring transparency and authenticity of recycled materials.

KPMG's modelling suggests that embracing a circular economy could increase Australia's GDP by A\$23 billion by 2025.<sup>28</sup>

### Advances in Materials Science in Australia

Australia is making significant strides in materials science to support the circular economy. Samsara Eco, a climate tech company, has developed a new enzyme capable of breaking down nylon 6, enabling the indefinite recycling of this material.

This innovation allows for the conversion of discarded plastics into clothing, reducing reliance on virgin materials and minimising waste.

Samsara Eco's process, developed in partnership with the Australian National University, involves breaking down plastics to their original molecular forms, facilitating continuous recycling without degradation. The company has raised over A\$150 million since its inception in 2021 and is expanding into Europe & North America, planning commercial recycling plants capable of producing 20,000 to 50,000 tonnes of polymers annually.<sup>29</sup>

## ESG INVESTING TRENDS

The landscape of ESG investing is experiencing notable shifts influenced by political developments. In 2025, the re-election of Donald Trump as U.S. President is anticipated to impact sustainable finance trends, with potential rollbacks on environmental policies.

Despite these challenges, sustainable investments continue to show resilience globally. For example, in the third quarter of 2024, there was a net global inflow of US\$10.4 billion into sustainable funds, indicating sustained investor interest in ESG-aligned assets.<sup>30</sup>

### INVESTMENTS IN CIRCULAR ECONOMY

**Investment Funds:** The European Circular Bioeconomy Fund invests in early-stage companies with innovations in circular and bio-economy technologies. As of 2023, the fund has made a €65 million investment, supporting ventures that focus on biomass production, bio-based chemicals, and materials, thereby fostering the growth of the circular economy in Europe.

In Australia, the Circular Future Fund, a partnership between Boston Global and Planet Ark launched in December 2024. The fund invests in companies driving circular economy innovation, focusing on waste reduction, product stewardship, recycling infrastructure, regenerative agriculture, and sustainable materials.

"Investors have a unique opportunity to shape the future by backing circular economy ventures. With the National Reconstruction Fund prioritising advanced manufacturing, sustainable materials, and recycling, circular initiatives are now an attractive asset class with strong growth potential." says Paul Klymenko.

### Cost-Benefit Analysis for Australian Companies Adopting Circular Models

Adopting circular business models presents both opportunities and challenges for Australian companies. The Australian Government's Chief Scientist reports that sectors such as mining, construction, manufacturing, agriculture, and waste management have significant potential to advance a circular economy.<sup>31</sup>

Australia's strong foundation of a diverse and skilled workforce, coupled with robust research and innovation capabilities, supports these sectors' comparative advantages in maximising benefits from a more circular economy.

<sup>27,28</sup>KPMG. (2023). Advanced industrial manufacturing supporting a circular economy <https://kpmg.com/au/en/home/insights/2023/10/industry-4-0-industrial-manufacturing-circular-economy.html>.

<sup>29</sup>Lynch, J. (2024). Samsara Eco strikes recycling 'breakthrough'. <https://www.theaustralian.com.au/business/technology/samsara-eco-strikes-recycling-breakthrough-turning-more-plastics-into-clothes/news-story/b14f383c98ba3c3fbc636cfa2708cd3>. <sup>30</sup>Ross, A. (2025). Can sustainable investing survive Trump 2.0? Financial Times. <https://www.ft.com/content/14ee5968-79de-42bf-80a4-811531e80de7>.

<sup>31</sup>CSIRO (2024). Australia's comparative and competitive advantages in transitioning to a circular economy. [https://www.chiefscientist.gov.au/sites/default/files/2024-04/23-00596\\_ENV\\_REPORT\\_AustraliaComparativeAndCompetitiveAdvantages\\_WEB\\_240404.pdf](https://www.chiefscientist.gov.au/sites/default/files/2024-04/23-00596_ENV_REPORT_AustraliaComparativeAndCompetitiveAdvantages_WEB_240404.pdf) <sup>32</sup>CSIRO (2024). Building a circular economy. [www.csiro.au](http://www.csiro.au). <https://www.csiro.au/en/about/challenges-missions/circular-economy>.

Additionally, Australia's proximity to Asian manufacturing hubs and markets, supported by policy and institutional frameworks conducive to investment, further amplifies and reinforces the nation's potential for achieving favourable outcomes in a circular economy.<sup>32</sup>

### Return on Investment (ROI) for Investors in Australia's Circular Economy Ventures

Investors are increasingly recognising the potential of circular economy ventures in Australia. The establishment of facilities like the Spreyton Materials Recovery Facility in Northern Tasmania, valued at A\$24 million, demonstrates the commitment to enhancing recycling capabilities. Operated by Veolia, this state-of-the-art facility processes approximately 20,000 tonnes of paper, glass, plastic, and metals annually, significantly increasing Tasmania's recycling capacity.

Such investments not only contribute to environmental sustainability but also offer promising financial returns, as the demand for recycled materials continues to grow.

### Long-Term Value Creation vs. Short-Term Challenges in Australia

Transitioning to a circular economy in Australia offers substantial long-term benefits, including resource efficiency, waste reduction, and economic growth. However, companies may face short-term challenges, such as the need for upfront investments and the restructuring of existing business models. The CSIRO emphasises that achieving an 80% resource recovery rate from all waste streams by 2030 will require unprecedented national collaboration between the science, business, policy, and community sectors. Engagement with multiple Australian industries across energy, food, mining, manufacturing, and others is essential to realise these long-term benefits.<sup>33</sup>

### CASE STUDIES

**ASML:** A leading semiconductor equipment manufacturer, is refurbishing old lithography machines to reduce waste and promote sustainability within the tech industry. This initiative not only minimises environmental impact but also addresses the growing demand for semiconductor equipment.

**Arc Ento Tech:** An Australian tech startup founded in 2020, has secured A\$5 million to construct three new energy plants at landfill sites in Sydney. These facilities will employ a dual process: a biological method using black soldier flies to digest organic waste, producing insect meal and fertilizer, and a mechanical method that converts plastics and other non-digestible materials into refuse-derived

reductant (RDR), an alternative fuel. This approach not only addresses waste management challenges but also contributes to sustainable energy production, underscoring the company's commitment to reducing reliance on primary resources and mitigating environmental impact.<sup>34</sup>

### Iondrive's Battery Recycling Technology:

Iondrive, a battery technology company, plans to establish a pilot plant in Adelaide to test a new, environmentally friendly recycling process for lithium-ion batteries. The technology, developed by the University of Adelaide, uses benign organic solvents to extract metals like lithium, nickel, cobalt, and manganese from used batteries, offering a greener alternative to traditional methods. This initiative addresses the growing issue of battery waste and aligns with global trends towards sustainable energy solutions.

**Close the Loop:** an Australian company, has based its entire business on providing circular products and services. For example it has developed a process to recover value from used printer cartridges and soft plastics by incorporating them into road construction materials.

This innovative approach not only diverts waste from landfills but also produces road surfaces that last up to 65% longer than traditional asphalt. In each kilometre of road laid, approximately 530,000 plastic bags, 168,000 glass bottles, and waste toner from 12,500 printer cartridges are utilised, demonstrating a practical application of circular economy principles.<sup>35</sup>

### COMPANIES TRANSITIONING TO CIRCULAR BUSINESS MODELS

**Patagonia:** operating in Australia, has been at the forefront of the circular economy movement since 1986, when it initially committed to sustainability. The apparel company intends to lessen its environmental effect through a variety of programs, including The Worn Wear program, which encourages customers to repair, reuse, and recycle their clothing.

The program provides a repair service for any damage to the clothing, as well as a trade-in option in which consumers are given store credit for old Patagonia items. Patagonia's effort has successfully extended the lifespan of its items while reducing waste.

The brand also introduced a line of clothing that incorporates recycled materials and uses organic cotton and other sustainable fibres. By adopting sustainable materials, Patagonia is making strides to reduce the environmental impact of its products and promote a circular economy.<sup>36</sup>

<sup>33</sup>KPMG. (2023). Advanced industrial manufacturing supporting a circular economy - KPMG Australia. <https://kpmg.com/au/en/home/insights/2023/10/industry-4-0-industrial-manufacturing-circular-economy.html>.

<sup>34</sup>Lynch, J. (2024). Sydney to get three plants to convert waste into energy after start-up raises \$5m. <https://www.theaustralian.com.au/business/technology/sydney-to-get-three-plants-to-convert-waste-into-energy-after-startup-raises-5m/news-story/77bbffa655e53a2d3f2d4343a836c71>. <sup>35</sup>Thornton, A. (2019). These 11 companies are leading the way to a circular economy. World Economic Forum. <https://www.weforum.org/stories/2019/02/companies-leading-way-to-circular-economy/>.

<sup>36</sup>10 Companies Promoting the Circular Economy in Australia. <https://www.whatgoesaround.com.au/blog-posts/10-companies-promoting-the-circular-economy-in-australia>.



**IKEA:** has committed to becoming a fully circular business by 2030, embedding circular economy principles into its entire value chain. Recognising the environmental impact of its traditional linear production model, IKEA has shifted toward designing products that are easier to repair, reuse, resell, and recycle.

A key initiative is its Buy Back & Resell program, which enables customers to return used IKEA furniture for resale, reducing waste and extending product lifespans. Additionally it is transitioning to using 100% renewable or recycled materials in its product lines.

Investment in circular business practices is also key to IKEA's transformation and it has allocated over €200 million to accelerate sustainability initiatives, including new material innovation and circular supply chains. As the company scales these initiatives globally including in Australia, it is demonstrating how circular business models can drive both commercial success and environmental responsibility

### Circular Future Fund

The Circular Future Fund, a joint venture between Boston Global and Planet Ark, is a groundbreaking initiative aimed at accelerating Australia's transition to a net-zero circular economy. With a target fund size of over A\$1 billion by 2030, the fund focuses on investing in projects that reduce climate change impacts, biodiversity loss & toxic pollution.

Australia currently ranks among the lowest in material productivity within the OECD, generating only US\$1.20 of economic output per kilogram of materials consumed, compared to the OECD benchmark of US\$2.50.

The fund will provide equity, debt, and project financing to companies innovating in circular infrastructure, waste reduction, sustainable materials, and regenerative agriculture.

The fund supports “ready-to-go” businesses that have established a proof of concept and are emerging from the venture capital phase, scaling companies seeking to roll out proven technologies & transitioning firms that enable long-term economic and environmental resilience.



### éthica capital & Green Bond Corporation

In December 2024, the Australian Government unveiled the National Circular Economy Framework, aiming to double the nation's circularity by 2035. This ambitious plan targets a 10% reduction in per capita material footprint, a 30% increase in material productivity, and an 80% resource recovery rate opportunities.<sup>38</sup>

To drive these initiatives, securing appropriate funding is crucial. éthica capital offers tailored financial solutions, including equity, debt, and carbon funding, to support projects aligned with circular economy principles. Partnering with éthica capital can provide the necessary resources to develop and scale your project, contributing to Australia's sustainable future.

éthica capital, Green Bond Corporation SARL (GBC), and Carbon Capital Corporation (CCC) form part of The Green Bond Corporation Group (GBC Group). GBC Group brings together extensive knowledge & insights in sustainable finance, infrastructure development & carbon-based financing. The group aims to support organisations in achieving environmental and humanitarian objectives, enabling them to make a significant positive difference while enhancing their success.

<sup>33</sup>KPMG. (2023). Advanced industrial manufacturing supporting a circular economy - KPMG Australia. <https://kpmg.com/au/en/home/insights/2023/10/industry-4-0-industrial-manufacturing-circular-economy.html>.

<sup>34</sup>Lynch, J. (2024). Sydney to get three plants to convert waste into energy after start-up raises \$5m. <https://www.theaustralian.com.au/business/technology/sydney-to-get-three-plants-to-convert-waste-into-energy-after-startup-raises-5m/news-story/77bbffa655e53a2d3f2d34343a836c71>. <sup>35</sup>Thornton, A. (2019). These 11 companies are leading the way to a circular economy. World Economic Forum. <https://www.weforum.org/stories/2019/02/companies-leading-way-to-circular-economy/>.

<sup>36</sup>10 Companies Promoting the Circular Economy in Australia. <https://www.whatgoesaround.com.au/blog-posts/10-companies-promoting-the-circular-economy-in-australia>.

éthica | capital.



Report by éthica capital  
 contact;  
 e: [hello@ethica.capital](mailto:hello@ethica.capital)  
 w: <https://www.ethica.capital/>  
 [@ethica.capital](https://www.instagram.com/ethica.capital)

Access all of éthica capital's Industry Reports via  
 éthica capital's website or Bloomberg terminal

---

**Disclosure & Disclaimer** – éthica Capital Pty Ltd is a corporate authorised representative (CAR) of SA Capital Pty Ltd (SAC) AFSL 291787, CAR Number 001296395. To the extent to which this document contains is for informational purposes only, this document does not contain personal advice and has been prepared by the CAR for individuals identified as wholesale investors for the purposes of providing a financial product or financial service, under Section 761G or Section 761GA of the Corporations Act 2001 (Cth).

The information herein is presented in summary form and is therefore subject to qualification and further explanation. The information in this document is not intended to be relied upon as advice to investors or potential investors and has been prepared without taking into account personal investment objectives, financial circumstances or particular needs. Recipients of this document are advised to consult their own professional advisers about legal, tax, financial or other matters relevant to the suitability of this information.

The investment summarised in this document is subject to known and unknown risks, some of which are beyond the control of CAR and their directors, employees, advisers or agents. CAR does not guarantee any particular rate of return or the performance, nor does CAR and its directors personally guarantee the repayment of capital or any particular tax treatment. Past performance is not indicative of future performance.

The materials contained herein represent a general summary of CAR's current portfolio construction approach. CAR is not constrained with respect to any investment decision making methodologies and may vary from them materially at its sole discretion and without prior notice to investors. Depending on market conditions and trends, CAR may pursue other objectives or strategies considered appropriate and in the best interest of portfolio performance.

There are risks involved in investing in the CAR's strategy. All investments carry some level of risk, and there is typically a direct relationship between risk and return. We describe what steps we take to mitigate risk (where possible) in the investment documentation, which must be read prior to investing. It is important to note that despite taking such steps, the CAR cannot mitigate risk completely.

This document was prepared as a private communication to clients and is not intended for public circulation or publication or for the use of any third party, without the approval of CAR. Whilst this report is based on information from sources which CAR considers reliable, its accuracy and completeness cannot be guaranteed. Data is not necessarily audited or independently verified. Any opinions reflect CAR's judgment at this date and are subject to change. CAR has no obligation to provide revised assessments in the event of changed circumstances. To the extent permitted by law, SAC, CAR and their directors and employees do not accept any liability for the results of any actions taken or not taken on the basis of information in this report, or for any negligent misstatements, errors or omissions. This Document is informational purposes only.

---