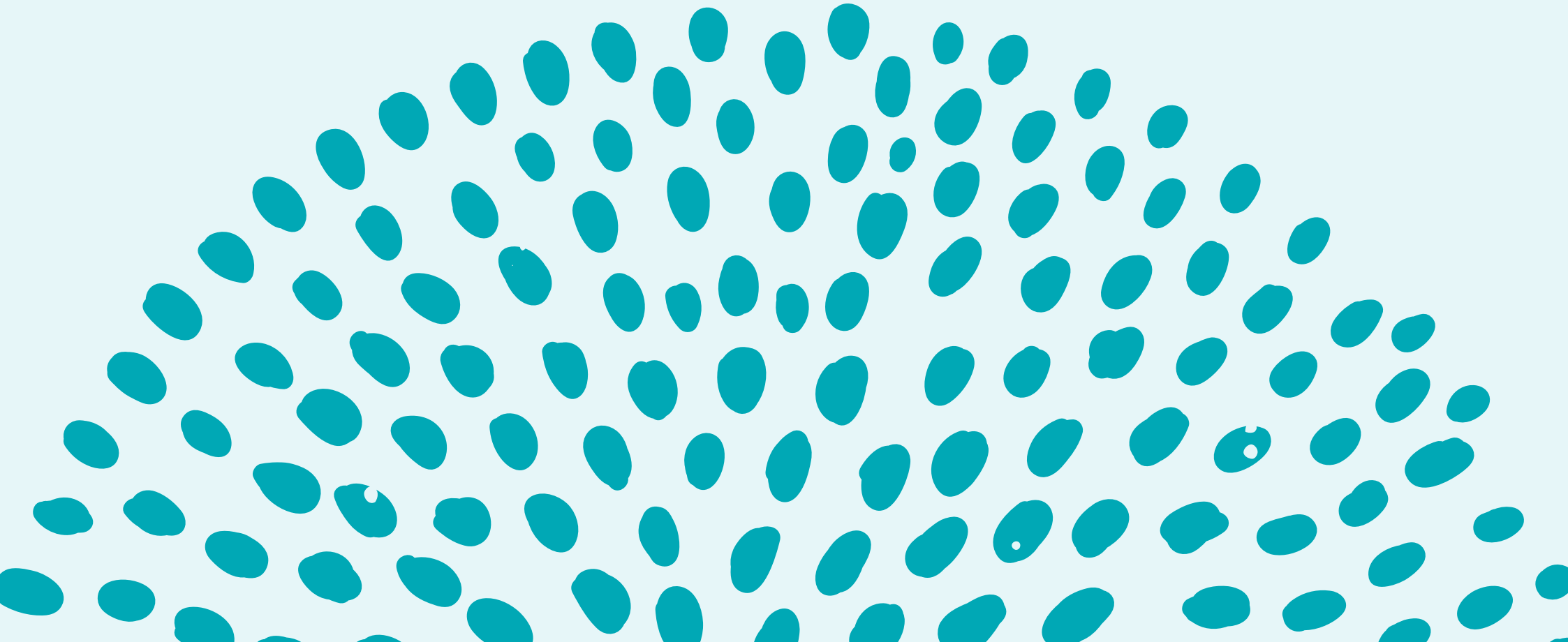
CIRCULAR ECONOMY
MINISTERIAL ADVISORY GROUP

Interim report

# Circular Economy
# Ministerial Advisory Group

April 2024



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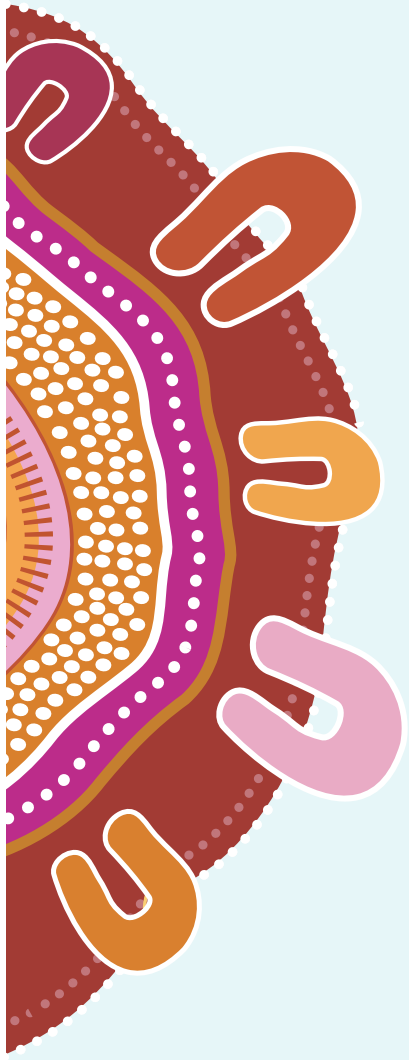
Department of Climate Change, Energy, the Environment and Water
GPO Box 3090 Canberra ACT 2601
Telephone 1800 920 528
Web dcceew.gov.au





## Acknowledgement of Country

We acknowledge the Traditional Owners of Country throughout Australia and their continuing connection to land, skies, waters, and community. We pay our respects to their cultures and their Elders past, present and emerging.

Indigenous knowledge is critical to living sustainably in Australia. The 65,000 years of knowledge that Aboriginal and Torres Strait Islander peoples hold as Custodians of Australia's land and natural resources can and should underpin a fair and just circular economy transition.

We recognise that the economies of First Nations peoples were and are based on Indigenous Knowledge systems, including understanding the different seasons across the continent, ways to care for land, water, species, their habitat and their inter-relatedness upon which we all depend. Generations of occupancy, land, water and sea management, cross-continental and international trade mean that First Nations peoples have an under-utilised and un-recognised body of knowledge in relation to this country, its biodiversity and ways to tread lightly on this place.

We therefore acknowledge the expertise, research, advocacy and experience of First Nations peoples who have generously contributed to the work of the Circular Economy Ministerial Advisory Group and look forward to further conversations with First Nations peoples while we continue work to develop our advice.

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# Letter of transmittal

Dear Minister Plibersek

One year on from Australia's step-change in commitment to a circular economy, I am pleased to present this interim report, summarising the early findings of the Circular Economy Ministerial Advisory Group. The Advisory Group's expert advice outlines strategic interventions for the Australian Government to drive the circular economy transformation forward.

The headwinds of environmental and economic challenges facing Australia demand a departure from the linear take-make-dispose model that has long defined our economic practices. Through stronger regulation, clear national policy setting, filling critical information gaps, and strategic use of economic and investment powers, the Australian Government can catalyse a whole-of-economy shift. The dividends—economic, environmental, and social—that would accrue from such a shift are not just evident but imperative for fortifying our nation's long-term resilience.

Our ongoing work and counsel underscore both the magnitude of the opportunity and the complexity of the challenge ahead. Transitioning to a circular economy demands concerted efforts across the whole of our economic landscape. This means that it must have a whole-of-government approach – across all portfolios.

Transitioning to a circular economy is not something that we can do in isolation, or over a short stretch of time. The benefits of circularity too, are broad. A more circular economy will be a more resilient one. By promoting local production, reuse, repair, and recycling, the circular economy agenda directly support our domestic manufacturing capabilities. It also reduces our dependence on new, emissions-intensive products by making better use of the materials already in the economy.

I eagerly anticipate what's to come in 2024, as the Advisory Group adds to and further refines our recommendations for the Australian Government. My sincere appreciation goes out to the committed individuals, organisations, and policymakers whose contributions have enriched our work to date, including the Commonwealth Ministers who joined our discussions.

**John Thwaites**
Chair

Circular Economy Ministerial Advisory Group

# Summary of advice

This report consolidates the preliminary advice of the Circular Economy Ministerial Advisory Group (the Advisory Group) to the Australian Government at the half-way point of our tenure. We are grateful to the Commonwealth Ministers who generously engaged with the Advisory Group through our meetings over the course of 2023.

The recommendations we have identified and discussed with members of Government to-date are organised into the six topics that the Advisory Group considered in 2023:

- National policy setting
- Targets and indicators
- Economics
- Net zero
- Design and consumption of products
- Built environment

## Our advice focuses on challenges and opportunities for Australia's transition

The Advisory Group first met in February 2023, and was established to provide advice to the Australian Government on opportunities and challenges for Australia's transition to a circular economy.

This includes:

- Opportunities associated with Australia's circular economy transition
- Regulatory, commercial, and other barriers to a more circular economy
- Best practice initiatives that show promise for adoption and/or expansion in Australia
- Circular economy research, development, and innovation needs, and
- Effective measurement and communication about progress towards Australia's circular economy.

## Based on the group's expertise, evidence and consultation

The Advisory Group comprises 15 experts with a diverse range of experience and skills relevant to the whole-of-economy thinking that the circular economy requires (Appendix 2). This includes expertise in skills and training, engineering, the built environment and construction, public policy, innovation, lawmaking, financial markets, and First Nations priorities.

At each of our meetings we consider seminal research and reports relevant to the topic, to ensure our advice is grounded in current evidence. Our advice is further informed by consultation with relevant industry, government, and non-government organisations, including through industry submissions and invited attendance at our meetings.

## And recommends what the Australian Government should do.

The Australian Government is broadly responsible for 4 domains of circular economy action; our advice is organised against each of these responsibilities.

### Regulation

The Australian Government is responsible for national regulation including at the border, implementing international agreements, competition and consumer regulation, and shares responsibility with States and Territories for chemicals regulation and building codes. Regulation is effective at lifting market laggards to adopt best practice.

### Policy

The Australian Government sets the strategic direction for the circular economy through the development and implementation of national policies and engagement in international negotiations. National policy helps galvanise and coordinate the work of jurisdictions and align Australia with trading partners.

### Economics & investment

The Australian Government is responsible for fiscal and tax settings, trade policies, and structural reforms to enhance productivity. It also provides direct investment through grants and procurement. Economic levers can be effective at incentivising innovation and shaping new markets.

### Information & behaviour change

The Australian Government is well placed to generate and coordinate important public national science, research and other information to effectively guide and monitor Australia's transition. It can harness data and research for communication and behaviour change programs to lift our circularity.

## Our preliminary recommendations

# National policy setting

| Recommendations identified to date | | | Type |
|---|---|---|---|
| 01 | **Developing the National Circular Economy Framework** | The National Circular Economy Framework should:<br>• Articulate a clear vision for a circular economy for Australia, which will serve as an overarching point of reference for policy makers, businesses and communities, considering Australia's role in a highly globalised economy<br>• Define 'circular economy' for Australia, the benefits of circularity for climate, biodiversity, productivity and describe quantifiable risks from not improving circularity<br>• Be grounded in the principles of an equitable transition<br>• Describe Australia's comparative and competitive advantages. Describe the skills and innovation needs of a circular economy<br>• Describe the role of First Nation knowledge in Australia's circular economy transition<br>• Provide guidance on how circularity will be measured including alignment with international standards<br>• Identify priority sectors for affecting Australia's transition<br>• Provide guidance for key stakeholders in the economy. | Information and research |

# Targets and indicators

| Recommendations identified to date | | | Type |
|---|---|---|---|
| 02 | **National targets and indicators** | **Set national and sector-based circular economy targets** and routinely measure and report progress against the following **upstream indicators of circularity** in the Measuring What Matters framework:<br>• National extent of circularity<br>• Material footprint<br>• Domestic material consumption<br>• Resource productivity. | Policy |

# Economics

| Recommendations identified to date | | | Type |
|---|---|---|---|
| 03 | **Productivity Commission study on resource efficiency impact on economic growth** | The **Productivity Commission** should investigate how resource efficiency supports economic growth and productivity. | Information and behaviour change |
| 04 | **Circular economy in the Sustainable Finance Taxonomy and Green Bonds Framework** | Expand the scope of the sustainable finance taxonomy and Green Bonds framework to include the circular economy, in line with international best practice. At a minimum, the taxonomy should include 'do no significant harm' requirements for the circular economy. | Economic and investment settings |
| 05 | **Circular economy in sustainability-related risk reporting** | As an immediate and interim step, encourage voluntary sustainability reporting aligned with the materials/ resource-focussed aspects of ISSB S1, alongside mandatory climate-related reporting. Then mandate disclosure of these sustainability-related risks and opportunities. | Economic and investment settings |
| 06 | **Raise the profile of circular economy in directors' duties** | Explore with ASIC opportunities to raise the profile of circular economy activities in directors' duties. This could include asking the Australian Accounting Standards Board and ASIC to create guidance for how businesses can use the circular economy to comply with new climate-related disclosure requirements. | Economic and investment settings |

# Net Zero

| Recommendations identified to date | | | Type |
|---|---|---|---|
| 07 | **Circular economy in climate policy and net zero sector plans** | Embed circular economy principles and actions across key climate policies including all net zero sector plans, to support emission reductions. | Policy |
| 08 | **Research: Circular economy measures that support net zero** | Commission a study to determine the key circular economy measures in the Australian economy that will support net zero, and quantify emissions benefits where possible. | Information and behaviour change |
| 09 | **Research: Circular economy to manage net zero transition waste** | Develop an **assessment** on how the circular economy can be adopted to maximise the recovery of valuable resources that will help us to deliver our net zero transition . | Information and behaviour change |

# Design & consumption of products

| Recommendations identified to date | | | Type |
|---|---|---|---|
| 10 | **Circular economy framework power** | Revise and strengthen Commonwealth regulations to be fit-for-purpose and future-ready to support a circular economy, especially for products and materials. The Australian Government should consider:<br>• The development of a circular economy framework power, which would operate as an overarching framework for setting specific circularity requirements, including for products, materials and services<br>• Using this power to set or adopt national circular economy standards for products and materials or create relevant directives that drive circularity<br>• Focussing this framework power initially on fast moving consumer goods. | Regulatory |
| 11 | **Australian Circular Economy Systems Map** | Develop an Australian Circular Economy Systems Map (Map), which would include:<br>• Identification of pain points and barriers to the transition to a circular economy<br>• Co-design of opportunities that will deliver circular solutions. | Information and behaviour change |
| 12 | **Good design principles for circular design** | Develop good design principles for circular design that result in clear, concise and adoptable design criteria at a: product and service level, built environment level, business level, industry level and societal level. | Information and behaviour change |
| 13 | **National Reconstruction Fund to incubate circular markets** | Use the National Reconstruction Fund (NRF) to incubate markets for key areas/enablers of circular economy. This should be built into the design of the NRF and supporting documents. The NRF Board should ensure expert advice on the circular economy is considered in NRF Board deliberations. Co-Investment Plans should be informed by industry expertise in circular economy. | Economic and investment settings |

# Built Environment

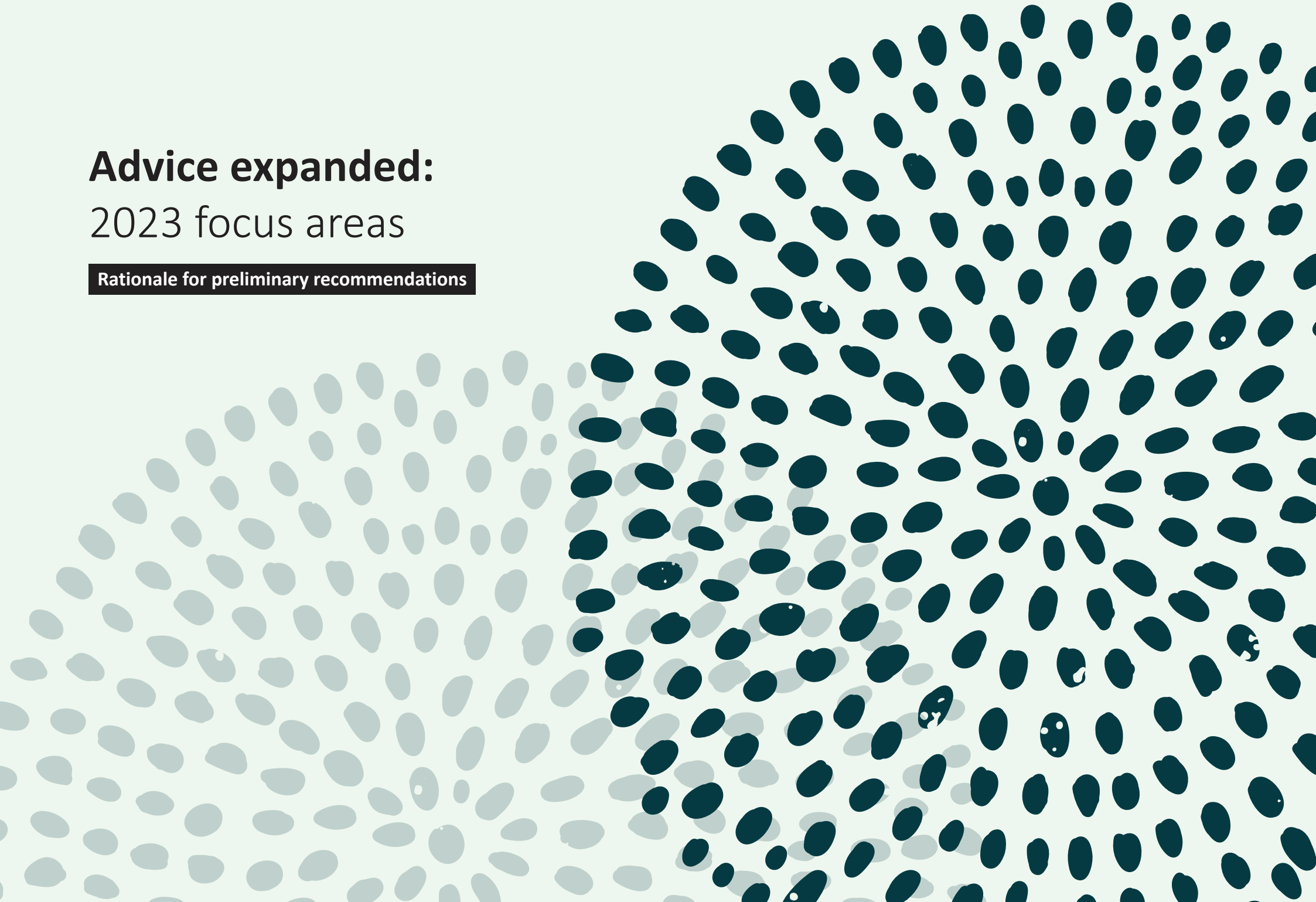
| Recommendations identified to date | | | Type |
|---|---|---|---|
| 14 | **Circular economy priorities in the built environment net zero sector plan** | Ministers with responsibility for developing the net zero plan for the built environment should consider how the plan can:<br>• Prioritise circular economy principles to support net zero such as:<br>– Refurbishment over demolition<br>– Design for modularity and disassembly<br>– Inclusion of recycled content<br>– Diversion of waste from landfill.<br>• Include benchmarks, expectations and/or targets to drive capacity building and uptake of these principles<br>• Include (or link to) a clear description of circular economy roles and responsibilities for sector actors (derived from Building 4.0 CRC project)<br>• Include specific long-term target/s around regenerative practice*<br>• Complete a peer review of the finalised plan to ensure the circular economy elements are adequately reflected.<br>*A regenerative target could drive industry towards practices essential for circularity like eliminating worst-in-class chemicals in new builds | Policy |
| 15 | **Leverage Commonwealth Procurement** | Introduce a two-pass process in building and infrastructure procurement to genuinely explore circular innovation before approaching the market. | Economic and investment settings |
| 16 | **Leverage state and territory procurement** | Work with states and territories on nationally consistent requirements for tenderers to address circularity in their business cases for infrastructure, capital works and government buildings projects. Support adoption of these nationally consistent requirements in local government procurements. | Economic and investment settings |

# Built Environment

| Recommendations identified to date | | | Type |
|---|---|---|---|
| 17 | **Leverage the Federation Funding Agreements** | Work with states and territories to embed circular economy principles in infrastructure Federation Funding Agreements. | Economic and investment settings |
| 18 | **Recycled content first Commonwealth procurement policy** | Introduce a national 'recycled content first' type policy to help drive recycled content markets and ensure national consistency. | Economic and investment settings |
| 19 | **Embodied carbon and circular economy in the National Construction Code** | The Australian Building Codes Board update the National Construction Code to address embodied carbon in fit outs and capital works, and also consider how the code can support circular end-of-life practices for buildings such as disassembly, reuse and recycling and record keeping across the life of buildings to support reuse at end-of-life. | Regulatory |
| 20 | **Construction industry central coordination point** | Work with jurisdictions to agree a central coordination and support point and/or approach to guide the construction industry's transition to circularity. This should include progressing:<br>• A national database of environmental product disclosures and model procurement clauses<br>• A function and approach to identifying market opportunities and innovation capacity building<br>• Provision of an educative and upskilling function for industry<br>• Communication to industry and the general public to support the other changes proposed. | Information and behaviour change |

# **Advice expanded:**
# 2023 focus areas

**Rationale for preliminary recommendations**



# National policy setting

## Advice and considerations

Australia's efforts on the circular economy have historically been directed at end-of-life management and recycling. The *National Waste Policy (2018)* and *Action Plan (2019)* include circular economy principles but focus on end-of-life actions that reduce waste and boost recycling. While these are critical to a circular economy, they are only part of the story.

Recognising this gap, at their June 2023 meeting, Australia's environment ministers agreed that the Australian Government would develop a new National Circular Economy Framework (the Framework). This framework will be the first time Australia has a national policy on circular economy and will help guide Australia's transition.

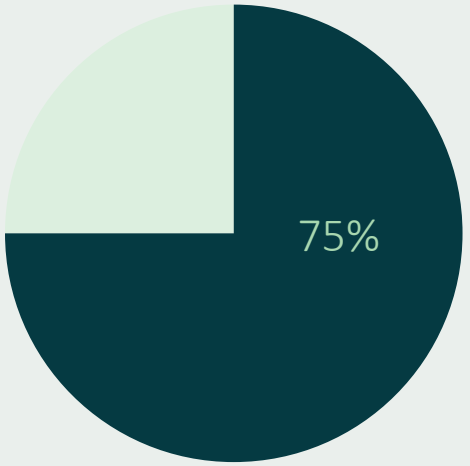
The Advisory Group recommends that to drive nationally coordinated effort, this new policy framework should consider the full lifecycle of materials, products and services, while remaining flexible to accommodate for changes over time and allow for best practice and innovation.

The Framework should also help identify priorities and the most effective interventions to drive Australia's transition. This focus is necessary to galvanise stakeholders' efforts and ensure focus is on high impact actions.

National consumer research highlights that the concept and value of the circular economy are not widely appreciated[1]. The Framework should also help clarify these at a national level and demonstrate the value proposition of the circular economy.

The Framework should embed National policy setting such as ensuring the circular economy transition is equitable, the rights of First Nation's peoples and their knowledge are included, and Australia's comparative and competitive advantages are maximised. It will be critical to recognise and address within the framework the specific challenges and opportunities in different sectors of the Australian economy. The Advisory Group will be providing further advice on the Framework in 2024.

**Key fact**




Around 75% of the G20 have an overarching circular economy policy, strategy or framework – **Australia does not.**

1 Commbank Consumer Insights, Circular Economy: the impact of business-led action on future consumers, October 2022

# Targets and indicators

## Advice and considerations

Australia does not currently benchmark its progress towards a circular economy beyond reporting waste generation and resource recovery rates in the National Waste Reports [2]. While end-of-life indicators are relevant, they do not capture the broader, up-stream aspects of the circular economy transition.

Leading international economies make measurement and reporting of a holistic set of circular economy indicators routine practice. For example, the EU has a circular economy monitoring framework which includes indicators covering material footprint, a measure of the materials needed to meet consumer demand, and resource productivity, the amount of GDP generated from resources consumed. Japan's measurement framework also includes an indicator of resource productivity. Some economies also set targets against their national indicators. For example, China has set a 2025 target to increase resource productivity by 20% compared to 2020 levels [3].

Targets and indicators provide clear direction to investors and industry on government priorities, enabling the private sector to respond.

Stakeholders including investors, economists and industry have consistently reported targets as essential to support industry action.

This aligns with evidence from the European Environment Agency that more structured information (including benchmarking) helps to inform decision making and to improve circular business investment decisions [4].

National indicators and targets for Australia also provide the opportunity to better align the circular economy transition agenda with other national and international agendas and their reporting.

This includes the Sustainable Development Goals (SDGs) and the Global Biodiversity Framework, both of which include circular economy-relevant aspects. For example, indicators for SDG 12 on responsible consumption and production, include material footprint and consumption rates.

Data on these indicators has been collected in Australia to update progress towards the SDGs. However, it is not routinely collected, and is not interrogatable by researchers or policy makers.

Other indicators of the circular economy transition include the 'circularity rate', which is being increasingly adopted by national economies. Circularity measures how much of the total amount of materials consumed in a country (to become a product, turned into a building etc) is secondary.

Global circularity is reported as around 7% [5]. Measuring circularity as a percentage suggests that an economy can be 100% circular; however, some material will always be lost when transformed into new products and recycled. In addition, the economic structure of a country determines its circularity potential (i.e., the total amount of materials that can be expected to be organised in a closed loop). This potential is well below 100% in all cases.

The indicators recommended here would expand the existing waste-focussed reporting to capture upstream activities across the lifecycles of resources, products and services. They also broadly capture trends in preserving the economic value of these, as well as trends in waste generation, and align with leading international economies and best practice.

**Indicators measured in Australia**

Australia currently tracks two headline circular economy metrics focussed on waste:

- Waste generation per person
- Resource recovery rate – the proportion of waste recovered for reuse, recycling or energy

These are picked-up in the Australian Government's Measuring What Matters framework, with the potential to expand the existing suite of indicators to also include those recommended above.

2 Circular Australia, Circular Economy Metrics: Case Studies for NSW Nov 22 (circularaustralia.com.au), 2022
3 China Briefing, China's Circular Economy: Understanding the New Five Year Plan (china-briefing.com), 2021
4 European Environment Agency, 'Circular economy in Europe', 2016.
5 Circle Economy Foundation, 'CGR 2024 (circularity-gap.world)', 2024.

## Implementation considerations

In implementing the above, the Advisory Group also draws attention to the following:

The need to balance between indicators that sufficiently measure circularity and the reporting burden

That indicators should be appropriate to the Australian economy and sensitive to improvements in priority sectors and supply chains

That indicators should be able to be broken up by sector to support sector specific targets and drive actions in particular industries, noting these will be different for each industry

The need to align indicators with:

- those used by states and territories to ensure national consistency
- international indicators including the SDGs, to allow international comparison.

The opportunity for circular economy targets to be included in the net zero sector plans as well as in the National Circular Economy Framework.

The Advisory Group recommends that the Australian Government consider including targets in its National Circular Economy Framework due for release at the end of 2024.

# Economics

## Advice and considerations

Government has an important role in getting the economic settings right to support investment in Australia's circular economy transition.

International literature suggests a circular economy can drive economic growth and reduce risk. It does this by lifting production efficiency, supporting new innovative business models and products and through productivity spillovers (e.g. sharing new technology). There is some limited modelling of the economic opportunities represented by a circular economy for Australia, which suggest actions could support a significant increase to GDP.[6] However, these analyses are not whole-of-economy or comprehensive. A better understanding of how the circular economy supports economic growth in Australia will help inform decisions on how to target economic interventions.

**Figure 1:** the Treasurer and Minister Plibersek attending the Advisory Group's meeting on Economics and Indicators on 9 October 2023

## Supporting investment in circularity

Investment in the circular economy will ultimately be driven by confidence in the market demand for circular materials, goods and services, and when investors and businesses have the tools they need to support investment in businesses offering these materials, goods and services.

The recommendations made by the Advisory Group to set targets for Australia's transition (see Targets and Indicators section), and for the Australian Government to use its procurement power (see Built Environment section), are both aimed at creating the market demand. The other recommendations discussed with the Government to date focus on the tools that are necessary to support investor and business consideration of the circular economy in their decisions.

Sustainable finance strategies and frameworks are one such tool. The circular economy is already recognised internationally in different sustainable finance initiatives – both as a component of climate-focussed strategies, and as a stand-alone priority. For example, the EU Sustainable Finance Taxonomy [7] has included circular economy practices since the beginning of 2023 – recognising the links to net-zero and climate objectives. In addition, South Africa and the UK have declared that circularity will be a core objective of their own taxonomies currently under development.

Green Bonds are also increasingly featuring the circular economy. The Climate Bond Initiative (CBI) shows that global green bond and green loan issuance reached over US$250 billion in 2019 – up 51% compared to US$170.6 billion in 2018. The circular economy is addressed in green bonds through the topics of energy efficiency, the management of wastes and the efficient use of natural resources.

For Australia, integrating circular activities in its Sustainable Finance taxonomy and Green Bonds framework, as well as mandating risk disclosures on sustainability-related matters are the most relevant opportunities to embed the circular economy into our national sustainable finance settings.

6 PWC, 'Building a more circular Australia', 2021; KPMG, 'Potential economic pay-off of a circular economy', 2020.

7 Taxonomies play a crucial role in facilitating circular economy investment by providing a structured classification system that helps identify, categorize, and assess sustainable and circular business activities, guiding investors toward environmentally responsible and resource-efficient opportunities.

# Implementation considerations

## Sustainable finance taxonomy and green bonds

Australia's sustainable finance taxonomy should recognise that circular economy is essential to climate change mitigation. For many industries activities such as improving resource efficiency are key actions they must undertake while the grid decarbonises. Omitting these activities from the taxonomy disincentivises their use and hampers Australia's efforts to reach net zero.

Australian businesses will need to comply with the EU circular economy reporting requirements as well as criteria being developed in other jurisdictions. Industries with exposure in affected markets will already be thinking about how to report against these criteria. We will need standards and criteria that are interoperable with those being developed overseas but also fit for purpose in Australia.

The transition to net zero has the potential to be materials and waste intensive if circularity is not considered upfront. The 'do no significant harm' criteria also help integrate circularity into the climate objective ensuring all economic activities respect minimum circular economy safeguards.

## Circularity disclosure standards

Mandating disclosure standards for circularity can support consistent quality in reporting and elevate the profile of circular economy issues with firms. Mandatory disclosures can streamline and simplify reporting requests from banks and insurers.

It can also assist banks and insurers in filling in data gaps and uncertainties related to investing in circular economy activities.

Adopting standards aligned with the International Financial Reporting Standard's 'General Requirements for Disclosure of Sustainability-related Financial Information' (ISSB S1) would provide suitable coverage of material risks and opportunities for Australia and align with authoritative global standards. Recognising that adopting this type of standard may require a long lead time, as an interim step, we recommend that the Australian Government support voluntary reporting in line with ISSB S1. This would help prepare the sector and support businesses managing disparate reporting requirements.

## Communicating circular economy's risk mitigation potential

Several climate risk disclosure frameworks already recognise the role of the circular economy as a climate risk mitigation strategy. For example, the Taskforce on Climate-Related Financial Disclosures (TCFD) has created one of the most comprehensive climate-related risk frameworks, which includes resource efficiency as an essential climate change mitigation opportunity. Captured within their definition of resource efficiency is improved efficiency across production and distribution processes, buildings, machinery, materials, and transport.

They also recognise First Peoples' rights, providing guidance for ways to include recognition in circular economy frameworks.

It is not clear to what extent the inclusion of resource efficiency in TCFD's framework translates into businesses incorporating it in their risk frameworks, or whether it will feature in the Australian business community practice with the adoption of mandatory climate-related financial disclosure standards. The opportunity lies in raising business awareness to the potential use of circular economy strategies as part of their net zero- and broader risk-mitigation strategies. This will require lifting market-wide understanding of how circular economy activity can be leveraged to mitigate climate risk as well as lifting the profile of circular economy in directors' duties more generally.

### Key facts

Modelling done for the UK showed that an increase in resource productivity by 3% annually could translate to 7% GDP growth by 2030 compared to current practice, improve the trade balance by 1-2% of GDP, and, generate over 200,000 gross jobs to 2030 [8].

In a survey by the Global Impact Investor Network (GIIN), more than 40% of investors mentioned sustainable production and consumption as a key theme for their investments. In addition, as of 2020, more than 190 banks representing US$50 trillion in assets have signed the 6 Principles for Responsible Banking, the first 3 of which stimulate the growth of circular economy finance.

8 Business in the Community Circular Economy Taskforce, Resource Productivity and the Circular Economy: The opportunities for the UK economy, 2018.

# Net zero

## Advice and considerations

### Circularity supporting decarbonisation

The International Energy Agency's Net Zero by 2050 framework calls out the essential role of the circular economy in achieving the net zero transition, including through material efficiency and recycling of materials such as steel and plastics.

The circular economy is a cost-effective approach to reaching net zero. Like energy efficiency, better material efficiency helps reduce energy demand through improved production efficiency, keeping existing materials in use or using lower embodied carbon recycled material inputs. Analysis by the Clean Energy Finance Corporation (CEFC) found that circular economy practices like using waste products as concrete supplement was one of the most cost efficient and effective abatement options in the built environment [9]. Circular economy actions, such as re-use rather than 'knock down rebuild', also help retain the embodied carbon in Australia's existing stock of infrastructure and assets[10].

The Australian Government is developing decarbonisation plans for 6 key sectors including: electricity and energy; industry; resources; the built environment; agriculture and land; and, transport. Given the strategic importance of these plans in setting the direction for Australia's economy-wide net zero transition, the Advisory Group has recommended the plans all also consider the circular economy. This advice has been reflected in the Australian Government's commitment to address the circular economy as a cross-cutting issue in all 6 plans. The Advisory Group has also recommended a core set of circular economy actions that need to be included in particular sector plans.

Australia does not have country-specific evidence on the biggest opportunities where a circular economy can support net zero. The UK, among other countries, has commissioned research which helped target areas with biggest benefit. To support incorporation of circularity into the decarbonisation plans the Advisory Group recommended Australia commission such a study.

9 Clean Energy Finance Corporation (CEFC), 'Australian buildings and infrastructure: Opportunities for cutting embodied carbon', 2021.
10 CEFC, 'Landmark buildings and the path to net zero emissions', 2021.

## Circular economy as a safeguard against renewable infrastructure waste

As Australia is working to get to net zero emissions, there will be significant new investment in the deployment of new energy infrastructure. Embedding circular design features from the outset avoids future waste stockpiling, eliminates unsafe chemicals, and ensures value from materials such as critical minerals can be retained and used again to meet future infrastructure and technology needs. Internationally recommended measures to address exponentially increasing stocks of end-of-life electrical products include eco-design, material-specific recycling targets and extended producer responsibility schemes[11].

The opportunity to prevent future loss of valuable materials to landfill is now – as new renewable energy infrastructure is being built.

The Australian Government needs to ensure products, services and infrastructure supporting the transition are designed at the outset to be reusable, repairable, and/or recyclable to minimise waste creation, eliminate unsafe chemicals and maximise resource use efficiency and productivity.

Global competition for materials essential to the renewable energy transition is projected to increase in coming years. Use of recovered and recycled materials, such as critical minerals that can be extracted from end-of-life renewables and electronics, can help meet these demands, while simultaneously driving the domestic secondary material market. This helps diversify supply chains and contributes to material sovereignty.

It is important to note that Australia is less than 1% of global market share and is largely a product and technology importer. We recognise that economies who import most of what they use will be challenged in recycling these products at end of life into markets which are import filled by economies with stronger scale opportunities. For the uptake and use of recycling to be implemented, there needs to be a strong market readily available.

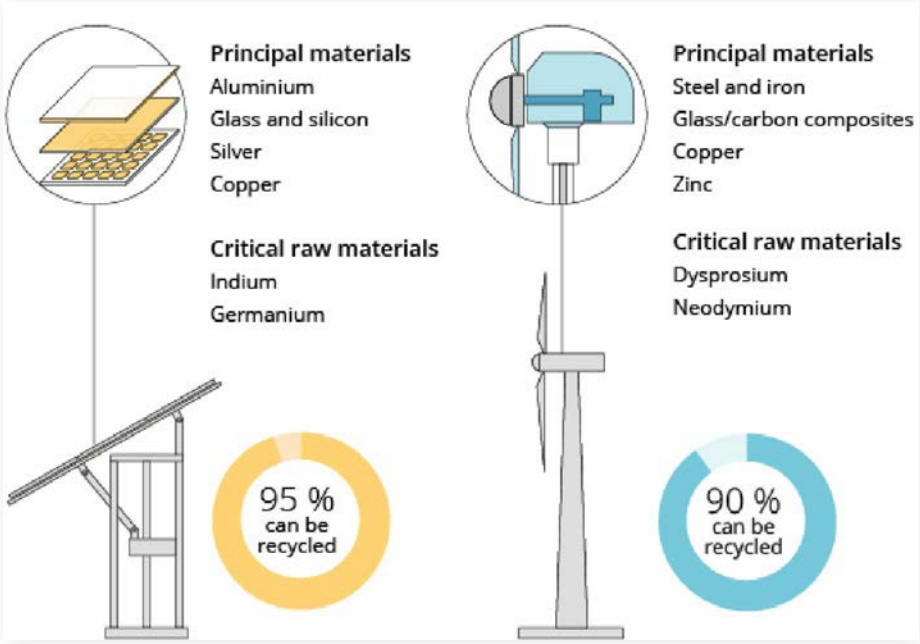



**Figure 2.** Clean energy infrastructure can be 90-95% recyclable when designed to be so. Adopted from European Environment Agency

11 European Environment Agency, 'Emerging waste streams: opportunities and challenges of the clean-energy transition from a circular economy perspective', 2021.

# Design and consumption of products

## Advice and considerations

The transition to a circular economy will require a redesign of our products, services, built environment, and business models, supported by social change and broader systems that are able to eliminate waste and ensure materials can be used again and again.

### Barriers to circular design and consumption

Evidence from literature and stakeholders identified several key barriers inhibiting circularity in the design and use of products, including:

#### Complexity

The circular economy transition needs overarching systems changes across the economy and is complicated by the fact that government responsibilities are split across all levels of government. Part of the solution for this challenge is through setting a national policy which outlines priorities, roles and responsibilities.

#### Product design does not take into account environmental impacts

Producers generally bear no cost for post-sale performance, repair costs or end-of-life costs. Products are increasingly designed for short lifespans and are more complex in design and functionality. This creates barriers to repair and difficulty in the separation of components for recycling. Stronger regulation, particularly around design standards, is being adopted overseas to address this issue.

Australia does not currently have a clear set of design principles for a circular economy, or clear understanding of where pain points are in the Australian economy. Submissions revealed that designing for circularity is product- and context-specific.

#### Challenges for consumers to make sustainable product choices

Information on a product's environmental characteristics is poor for both consumers and business. Greenwashing exacerbates confusion and leads to consumer cynicism and can ultimately lead to higher costs or greater time needing to be invested to resolve problems. Clearer expectations around design standards can help improve circular design of products supporting better consumer choices.

## Advisory Group preliminary recommendations on Commonwealth levers

Australia has some of the tools it needs on circular design and use of products but there are gaps.

### Regulation

The Australian Government has a key regulatory role – particularly at the border – to manage the flow of materials and products into the economy. While the Australian Government does have some powers to regulate product design (e.g. under the Recycling and Waste Reduction Act 2020), the current legislation is not well suited to integrated regulation that targets whole-of-life from cradle-to-cradle. It is also generally limited to requiring participation in a product stewardship scheme, of which there are only a few and most aren't mandatory.

The Advisory Group has recommended that Commonwealth legislation be revised so it is fit-for-purpose and future ready. This includes ensuring it is aligned to overseas best practice.

Adopting a regulatory framework power for the circular economy – similar to the EU's Ecodesign for Sustainable Products Regulation – is a logical starting point for issuing stronger circular economy standards for products over time. This could include strengthening design requirements for durability, repairability and recyclability, and address the significant quantity of imported products that are currently incompatible with the circular economy.

The Commonwealth could also consider new Extended Producer Responsibility regulatory frameworks where design mandates are modular and can be amended with updated material streams as Australia progresses in its circular economy transition.

### Market levers

The cost of capital to invest in the circular economy is high. More is needed to encourage businesses to invest and to encourage private funding, particularly in better material and product design. The Advisory Group recommended incubating markets through the National Reconstruction Fund (NRF), given the NRF's role in supporting manufacturing activities in Australia.

### Research, behaviour change and communication

Adopting good design criteria will provide better understanding across industry of the opportunities to drive the circular economy through design. Mapping systems or supply chains also provides visibility of barriers and opportunities for use of sustainable materials as inputs in the economy. There is also an opportunity to engage with Indigenous design expertise, and this requires further research.

## Implementation considerations

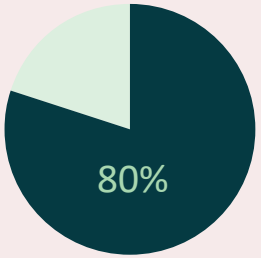
To date, the Advisory Group has identified several specific circular economy activities the Australian Government should consider pursuing in the product design and use space:

| Driving reusability | Supporting innovative business models | Supporting 'right to repair' | Countering greenwashing |
|---|---|---|---|
| including replacing single use with reuseable products and packaging and promoting repairable and durable products. | such as service, leasing, rental and sharing models that maximise the utility of products. | particularly making sure consumers have access so it's convenient and cost competitive to repair. | ensuring consumers and businesses have good access to information on the durability, repairability, recyclability etc of the products they are purchasing as well as overall environmental impacts. |

Further consideration needs to be given as to how to address challenges for businesses and consumers to make sustainable product choices. The Advisory Group plans to revisit this issue in 2024.

**Figure 3:** Minister Farrell and Minister Plibersek with Advisory Group members at their meeting on Design and consumption of goods held 2 May 2023

### Key facts




More than 80% of the environmental impact of a product is determined at the design stage [12]

Previous Commonwealth action has focussed on end -of-life and recycling, rather than upstream opportunities

Products, particularly fast-moving consumer goods and packaging are highly visible to the Australian community and are a practical starting point for building community understanding of the circular economy.

12 Ellen MacArthur Foundation, 'An introduction to circular design', 2022.

# Built environment

## Advice and considerations

The built environment accounts for a third of resource consumption globally and produces about 40% of Australia's solid waste [13]. Construction and demolition waste in 2020–21 was 29Mt in Australia and is the largest (and growing) source stream of all materials received and processed in recycling and waste re-use [14].

As a sector, the built environment is primed to take on circularity, especially in commercial buildings, future liveable cities and sustainable infrastructure. The challenge is overcoming barriers that are hindering broader uptake of circular practices.

### Circularity barriers in the built environment

#### Fragmentation

Roles and responsibilities are split in industry, across tiers of government and within governments. For example, there is a lack of centralised policy and no single point for industry to engage with government on policy in the built environment. Issues were also identified regarding the ability for supply chains to collaborate and the competing vested interests across value chains. National policy setting on the built environment and a central coordination and support point would help alleviate these issues.

#### Market failure

Stakeholders identified issues on the supply and demand side for materials like recycled content and for the design and construction of circular buildings and infrastructure. The evidence suggests we need solutions that address both supply and demand at the same time and connect the 2 to create markets. There are also the cost implications of the market to consider. Government procurement is a powerful lever to create certainty in demand by leading best practice and a central coordination point could help facilitate supply. The Indigenous Procurement Principles provide evidence of the ways in which this can support positive outcomes.

#### Planning and procurement

Current planning and procurement processes in the private and public sectors do not create the space needed to consider circular opportunities. If circularity is not considered at the very commencement of a project, it can potentially add costs and time, resulting in de-prioritisation.

Demonstrating feasibility through government procurement would help overcome these barriers. This could include government owed housing or buildings that make use of modularity or prioritise refurbishment over rebuild.

#### Long lifetimes lead to information gaps

Reuse and recycling of materials from buildings is currently challenging due to a lack of information on materials used and construction. Stakeholders reported that even when buildings are designed for disassembly they are often demolished because the information about the design is lost. Processes need to be considered to support better design for end-of-life and then communication of this information across the life of the asset. Consideration for the Commonwealth could include design standards set for components of modular builds to enable refurbishment, disassembly, and reuse. For example, setting national standard sizes, strengths or construction of concrete panels. Other opportunities lie in long-lived data about building composition.

#### Costs and levies

While recycling is an integral part of the circular journey, often landfill remains the cheaper alternative for disposal. Levies for landfill are controlled by state and territory governments, leaving a gap in the national direction for alternative options. Through collaboration, there is an opportunity to assess the current structure for landfill and recycling and encourage circularity as the best option.

13 Department of Climate Change, Energy, the Environment and Water (DCCEEW), 'National Waste Report 2022', 2022.
14 Department of Climate Change, Energy, the Environment and Water (DCCEEW), 'National Waste Report 2022', 2022.

## Advisory Group preliminary recommendations on Commonwealth levers

State and territory governments hold principal responsibility for managing the planning and governance of the built environment. They are also the primary investors, along with local government, in infrastructure including road, rail, water and power.

The Commonwealth plays a role in the built environment through direct investment in economic, transport and other infrastructure and through policy setting, its convening powers and intergovernmental agreements with jurisdictions.

### Leadership and strategic policy setting

The net zero sector plan on the built environment is an ideal place to set the national strategic direction on circularity for the built environment – to avoid doubling up with a separate, standalone national circular economy strategy for the sector. The Advisory Group has highlighted key circular economy actions and principles that need to be considered in this plan.

### Regulation

Omission of end-of-life considerations from the National Construction Code reinforces the lack of consideration of waste during building design and use. For buildings to become circular, the whole lifecycle needs to be considered within the one code. The Advisory Group recommends the Australian Building Codes Board consider how the National Construction Code can be used to better incorporate end-of-life planning into the design and construction stages. Strengthening requirements for all projects to consider lifecycle analysis at project conception would aid end-of-life opportunities.

### Market levers

The Commonwealth has a direct role to play in the market through its procurement of buildings and infrastructure, and as part of the negotiation of Federation Funding Agreements that govern the flow of investment to infrastructure through states and territories. Better use of these levers will help fuel the demand side of the market, providing greater certainty for supply, particularly of recycled content. There is also a role for the Commonwealth to play in working with other levels of government to embed circularity across public procurements more generally.

The ecologiQ model in Victoria shows the value in having a central support point for industry to facilitate creation of the market for recycled content. If Australia is going to successfully create circular markets in the built environment, industry will need this type of support

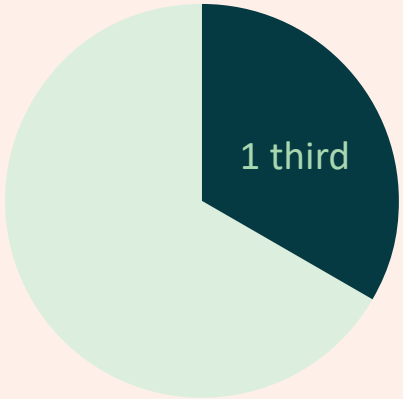
## Implementation considerations

There are several circular economy actions identified as priorities for focussing on Australia's transition. These should be reflected in national policy settings and in implementation.

- Refurbishment – avoiding knocking down buildings and infrastructure as much as possible and preferencing reuse and refurbishment. This is one of the most effective ways to reduce the material footprint of the built environment sector.
- Using recycled materials – the need to connect resources from demolition to new builds was strongly recognised by stakeholders. Not only does it reduce the material footprint of the sector, it is also an effective approach to lowering emissions.
- Design for modularity and disassembly – highlighted as a key activity that reduces waste at the start and end-of-life for buildings, which can also boost activity and allow greater flexibility to adapt a building's use over time.

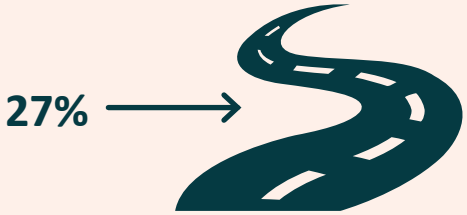
**Figure 4:** The Advisory Group meeting on the Built Environment and Net Zero held on 14 August 2023

**Key facts**




The built environment consumes 1/3 of global resources [15]


40% of landfill is construction waste [16]




Recycled material could replace 27% of virgin materials in road infrastructure [17]

15 McKinsey and Company, 'Accelerating green growth in built environment', 2022.
16 Department of Climate Change, Energy, the Environment and Water (DCCEEW), 'National Waste Report 2022', 2022.
17 Infrastructure Australia, Replacement Materials: Understanding the market for replacement materials across major infrastructure road projects, 2022.

# 2024 Focus Areas

**Rationale and key issues**

# Advisory Group forward work program

The following topics will form the basis of Advisory Group meetings in 2024.

| Focus area | Description | Stakeholders |
|---|---|---|
| **Innovation** | Transitioning to a circular economy will require innovation including in new products and materials, business models and recovery approaches that demonstrate systemic shifts in performance. This innovation has the potential to create new businesses and drive economic growth and manufacturing in Australia<br><br>Australia has made several inroads in research and innovation to drive a circular economy with private-sector and university-led innovation hubs. However, the scale of these initiatives remains small by global standards.<br><br>The Advisory Group will consider the circular economy research and development currently happening in Australia, how this knowledge diffuses through our economy and where Australia's comparative and competitive advantages lie. This will include alignment with other Net Zero and Climate initiatives. | Commonwealth portfolios for engagement: Innovation, Science and Education.<br><br>Priorities for engagement: public and private research organisations, venture capital investors, businesses commercialising circular initiatives. |
| **Skills** | Australia will need greater access to a broad range of both hard skills (engineering and digital capability) and supporting skills (such as design, circular business models and regulatory understandings) to capitalise on the circular economy opportunity.<br><br>Circular economy jobs will require different education and training. Core industries, such as repair, recycling and recovery, may not necessarily need high education. Many will require a general upskilling or reskilling of the workforce.<br><br>The Advisory Group will consider Australia's current circular skills capabilities, where there are gaps and how to deepen our capabilities. | Commonwealth portfolios for engagement: Education and Jobs and Skills.<br><br>Priorities for engagement: higher education, vocational education and training, specific industries to understand skills needs. |

| Focus area | Description | Stakeholders |
|---|---|---|
| **Food** | The food system is the largest driver of land-use change and the largest driver of biodiversity loss globally. The land required to grow the food wasted in Australia each year is the same size as the state of Victoria and food waste represents 3% of Australia's greenhouse gas emissions[18].<br><br>The Advisory Group will look across food system including agriculture, food manufacturing and processing, retail, hospitality, use and end-of-life and look for opportunities where Australia has a competitive advantage in adopting circularity.<br><br>Recommendations made to date will be tested against the food system to identify gaps and any food system specific recommendations needed. | Commonwealth portfolios for engagement: Agriculture, Fisheries and Forestry<br><br>Priorities for engagement: agriculture, food manufacturing, retail, hospitality, composters, financiers. |
| **Resources** | Australia is a major global supplier of natural resources. The mining industry contributes about 13.6% to Australia's GDP[19] and in 2023–24 it is forecast that Australian resource and energy export earnings will reach $390 billion.[20] Most of the resources mined in Australia are exported to service global manufacturing activities, with waste products retained onshore. This waste dominates Australia's material footprint. In 2018–19 mining waste was estimated at 620 Mt, more than 40 times the amount of Municipal Solid Waste generated.[21]<br><br>Moving into downstream processes for resources, where Australia can do so competitively will capture more value including economic benefit and open up more circular opportunities. Australia also has substantial mining byproducts and there are opportunities to recycle and reprocess materials. The Advisory Group will explore these and other opportunities as well as test recommendations to date to identify gaps and any resource specific recommendations needed. | *Comm*onwealth portfolios for engagement: Resources<br><br>Priorities for engagement: mining sector, recyclers, financiers, National Resource Recovery Code Board. |

18 DCCEW, Reducing Australia's food waste - DCCEEW, 2023
19 Department of Industry, Science and Resources (DISR), 'Resources and Energy Quarterly: March 2023', 2023.
20 Ibid.
21 Department of Climate Change, Energy, the Environment and Water (DCCEEW), 'National Waste Report 2022', 2022.

| Focus area | Description | Stakeholders |
|---|---|---|
| **Place based** | Circular economy strategies and actions can be applied at the precinct, neighbourhood, regional and city level. This requires a whole-of-system approach, recognising that everything is interconnected. It includes consideration of urban planning and how to use circular economy to support economic growth in regions. It also includes consideration of First Nations rights to land, heritage and alignment with other Net Zero and Climate initiatives.<br>There are several regions in Australia already considering how to incorporate circular economy into their planning. The Advisory will consider the opportunities in place based and opportunities for action from the Commonwealth. | Commonwealth portfolios for engagement: Regional development<br>Priorities for engagement: local government and regional development organisations, urban planners and cities. |
| **Water** | Water is one of the most circular substances on Earth and water utilities are at the heart of regions and communities. As such water can play a central role in embedding circular economy approaches in regions and urban areas.<br>Key areas of opportunity the Advisory Group will explore include opportunities in cycling water, water efficiency and circularity of water infrastructure. | Commonwealth portfolios for engagement: Water<br>Priorities for engagement: local government, urban planners and cities, water utilities. |
| **Gaps** | The Advisory Group will identify any gaps remaining in focus areas and revisit topics that require more attention. This is anticipated to include revisiting 'design and use of products' with a particular focus on design for durability, reuse and reparability, including how to better inform and support decision-making for consumers. It is also expected to concentrate on how to support other levels of governments, business and researchers. | *TBC* |

## Engagement

In the lead up to each meeting, the Advisory Group welcomes submissions from interested stakeholders. Before providing a submission, please reach out to the secretariat at circulareconomy@dcceew,gov.au for advice on the timing of upcoming meetings and the information being sought.

## Final report

The Advisory Group will provide a final report to the Australian Government through the Minister for Environment and Water by the end of 2024. The final report will include the full list of recommendations, including progress on those actioned during the group's tenure.

# Appendices

# Appendix 1
# Defining the circular economy and its importance

## What is a circular economy?

A circular economy is an economic model that promotes sustainable and efficient use of resources. It shifts away from the linear 'take, make, waste' consumption model to an approach where the value of resources is maintained in the economy for as long as possible.

There is no universally-agreed definition of the circular economy – reflecting the fact it is an economic and industrial strategy that is adaptable to the needs and priorities of different economies. However, most definitions recognise 3 core objectives for the circular economy[22]:

1. to design out waste and pollution from materials and products
2. to preserve and enhance the value of materials and products retaining them at their highest value through recovery and repurposing
3. to conserve natural resources and regenerate nature

In practice, a circular economy requires:

- Reducing the use of new raw materials, including through new businesses, more efficient production methods, innovative materials and using recycled materials
- Strategies to keep materials in use, such as designing for durability, repairability and eliminating toxic components or hazardous processes
- Reusing, recycling and refurbishing materials, at their highest value for as long as possible
- Reducing environmental impacts, including the prevention of pollution and loss of materials from the economy, and creating products that regenerate nature by design.

22 Drawn predominantly from the 3 Ellen McArthur principles, and 4 principles outlined in the Global Circularity Gap Reports

## Why Australia needs a circular economy

Unsustainable production and consumption of goods is a root cause of environmental issues including climate change, biodiversity loss and pollution. Australia's use of materials is high, and we still send too many valuable materials to landfill, while we continue to draw on more natural resources to make new products.

Australia has the third highest material footprint per capita in the Organisation for Economic Co-Operation and Development (OECD), and the fourth lowest rate of material productivity in (Figure 5). [23]

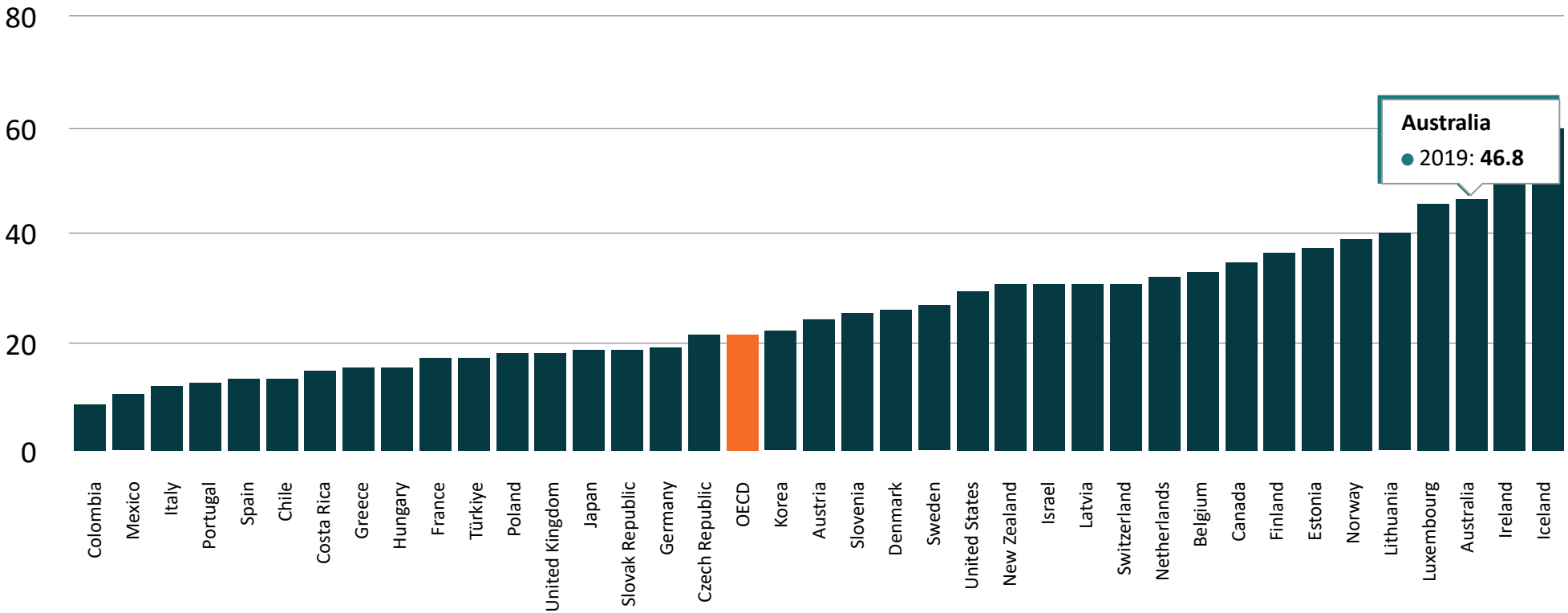



**Figure 5:** OECD Material Footprint Per Capita. Footprint measured in metric tonnes per person.

23 https://www.oecd-ilibrary.org/sites/f5670a8d-en/index.html?itemId=/content/component/f5670a8d-en

### Economic growth

The circular economy is an opportunity for innovation, economic growth and job creation. Research commissioned by the European Commission found that every percentage point improved in resource productivity translated to an economy that is more efficient and more productive, yielding between 100,000 and 200,000 additional jobs. First movers in the circular economy will be rewarded by rising global demand for goods and services that are required to meet agreed circular economy standards.

## Key facts

- Australia has the **fourth lowest rate** of **material productivity** in the OECD. We generate **US$1.20** of economic output for every kg of materials consumed, under **half the OECD** benchmark of **US$2.50.**[24]
- KPMG has estimated that improving the way we use materials in the food, transport and built sectors alone could add $210 billion to Australia's GDP by 2048.[25]
- Every year Australian firms spend $1.4 billion sending $26.5 billion worth of material to landfill[26].

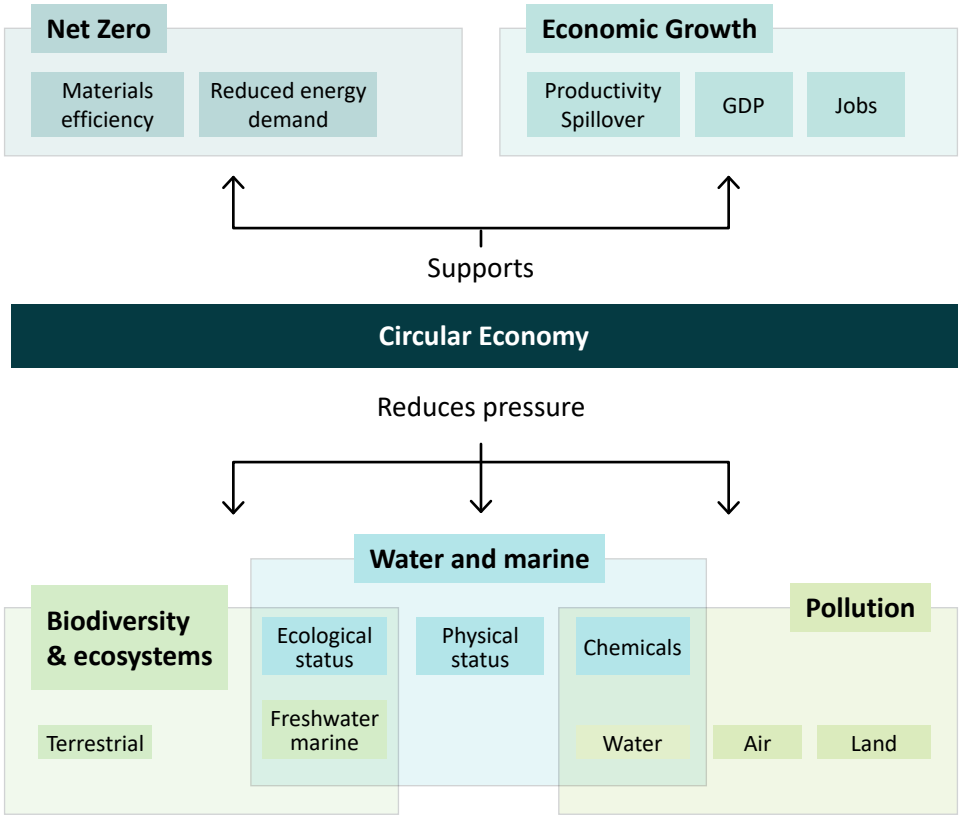



**Figure 6:** the benefits of a circular economy in supporting net zero and economic growth while reducing our impact on our environment.

Adapted from Platform on Sustainable Finance (2022), Technical Working Group: Part A: Methodological report, March 2022, https://finance.ec.europa.eu/system/files/2022-04/220330-sustainable-finance-platform-finance-report-remaining-environmen

24 OECD iLibrary, 'Environment at a Glance Indicators: Circular economy - waste and materials', 2024.
25 KPMG Economics, Potential economic pay-off of a circular economy (kpmg.com), 2020
26 DCCEEW, A study into commercial and industrial (C&I) waste and recycling in Australia by industry division (dcceew.gov.au) , 2021

**Net zero and climate change**

The vast majority of GHG emissions (70%) are generated through material extraction, production and use.
As the circular economy promotes keeping materials in use and cutting unnecessary consumption, it essentially acts as an emissions avoidance strategy that is integral to our net zero transition.

**Supply chain sovereignty**

By connecting producers of waste with novel (re)uses for these materials, the circular economy reduces dependence on raw materials and helps diversify significant global supply chains. Through practices like recycling and remanufacturing, businesses can source materials locally, minimising dependence on global supply chains vulnerable to disruptions. Finding an alternative use for unwanted material can also have substantial benefits to industry by reducing the cost of waste disposal.

By extending product lifecycles and promoting circular design, the need for constant extraction and importation of raw materials diminishes. This not only enhances resource security but also mitigates environmental impacts associated with resource extraction and transportation. Additionally, a circular economy encourages the development of local recycling and remanufacturing industries, creating jobs and stimulating economic growth.

**Biodiversity**

Unsustainable consumption of resources drives habitat destruction that results in biodiversity loss. For example, it's estimated that the land required to grow the food wasted in Australia is the same size as the state of Victoria.

Waste and pollution, like the 130,000 tonnes of plastic that leak into our oceans each year, are also a by-product of an inefficient economy and impact biodiversity.Over 800 species of fish, marine mammals and birds worldwide are affected by plastic pollution and around 99% of seabirds are predicted to have ingested plastics by 2025. The circular economy also relies on use of chemical inputs that can safely be recycled, and management of chemicals to mitigate environmental risks.

**Equitable Outcomes**

An Australian circular economy offers the opportunity for more equitable and accessible outcomes for all its people. Designing out waste, keeping resources in the economy longer, and embracing innovation, along with sharing and reuse business models can drive downward pressure on costs for households, businesses and communities.

Importantly, circular economy is a systems approach that embraces many First Nations long-held economic understandings of resource management and the interrelatedness of caring for and regenerating land, water, species and habitat. First Nations peoples have a body of knowledge and expertise to be recognised and activated to achieve an Australian circular economy by 2030. Recognising the rights of First Nations peoples to land, water, sea, species and heritage will enable Australia's circular economy transition.

## Australian action on a circular economy

Australian efforts on the circular economy have historically concentrated on end-of-life management, particularly recycling. Australia's National Waste Policy and accompanying Action Plan, developed in 2018 and 2019 respectively, are underpinned by circular economy principles but focus on waste management and recycling.

In October 2022, Australia's environment ministers agreed to work with the private sector to:

> *"**design out waste and pollution, keep materials in use and foster markets to achieve a circular economy by 2030.**"*

This commitment signals a shifting focus to the upstream and system-wide aspects of the circular economy – particularly product design, market and supply chain development, and cross-cutting economic and finance settings.

Australia has a second-mover advantage in the circular economy enabling us to adopt lessons learned from other economies. This has been a particular focus of the Advisory Group in informing our advice. Australia also has other advantages, including our role as a strong regional partner and an innate close connection between policy makers, regulators, industry and our primary resources.

Each of these distinctive trends will influence our transition pathway and are reflected in our advice.

At a jurisdictional level, most state and territory governments have developed circular economy strategies that cover material lifecycles. An increasing focus on the circular economy is evident in the private sector too – with circular economy themed investments reaching the third most common sustainability-themed investments according to the 2023 Responsible Investment Benchmark Report.

## Commonwealth enablers for circularity

The Commonwealth's role is to help commit to a coordinated system of enablers. To succeed in our circular transition, Australia will need to look at an ecosystem of enablers that leverages the range of Commonwealth powers on multiple fronts.

No one lever or intervention of the Commonwealth alone will deliver a circular economy for Australia.

Each of the sectors and systems considered by the Advisory Group (e.g. products) have their own specific policy, regulatory and market settings, with powers distributed across different portfolios and different tiers of government.

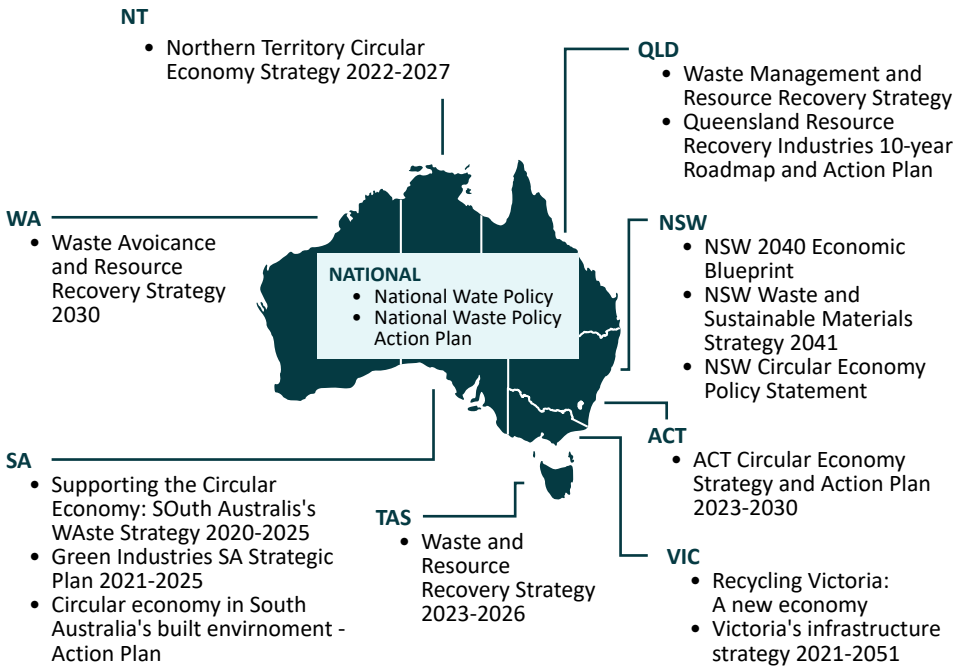



**Figure 7:** Circular economy related policies by jurisdiction as at 2023.

| Policy | Information and behaviour change |
|---|---|
| • National policy setting, which includes First Nations rights and Knowledge Systems<br>• International engagement including entering treaties and trade agreements<br>• Setting targets and indicators<br>• Convening power with:<br>– Governments<br>– Business<br>– Community. | • Partnerships and engagement with peak organisations<br>• Embedding circular economy knowledge and skills in education and training<br>• Commissioning research and data collection<br>• Campaigns and education<br>• Ecolabels and certification schemes. |
| **Regulation** | **Economics and investment** |
| • Product standards, sectoral codes, mandatory product stewardship, waste export bans (Recycling and Waste Reduction Act 2020)<br>• Water and energy efficiency<br>• Warranties and consumer protections (i.e., particularly against greenwashing).<br>• Regulations on pollutants (i.e., emissions to air and water) and chemicals of concern (e.g. PFAS). | • Economic and tax settings<br>• E.g. tax relief/ accelerated depreciation, consumer tax reductions<br>• Commonwealth procurement<br>• Public funding - Grants, subsidies etc<br>• Public investment and green bonds.<br>• Product stewardship including deposit refund schemes<br>• Investment in research development<br>• Fines and penalties. |

# Appendix 2
# Circular Economy Ministerial Advisory Group

## Role of the Advisory Group

The Circular Economy Ministerial Advisory Group advises the Australian Government on opportunities and challenges for Australia's transition to a circular economy.

The group provides advice to the Minister for the Environment and Water on key issues including:

- Opportunities associated with Australia's circular economy transition (nationally, and within specific sectors)
- Regulatory, commercial and other barriers to a more circular economy
- Best practice initiatives that show promise for adoption and/or expansion in Australia
- Circular economy research, development and innovation needs, and
- Effective measurement and communication about progress towards Australia's circular economy.

## Advisory Group membership and structure

Members were appointed by the Minister for the Environment and Water for an initial term of 24 months. Appointments were made on the basis of individual expertise rather than as representatives of organisations. The composition of the Advisory Group ensures a diverse range of skills and experience and reflects the whole-of-supply-chain focus of the circular economy.

The Advisory Group may, at its discretion, invite additional participants to join specific discussions on certain issues. The Advisory Group may also commission, through the Secretariat, research or analysis as required.

**Figure 8:** The Advisory Group pictured with Minister Plibersek and Minister Husic at their first meeting on 20 February 2023

## Professor John Thwaites

Chair AM

Professor John Thwaites AM is a Professorial Fellow, Monash University, and Chair of the Monash Sustainable Development Institute and Climateworks Centre.

John is a Director of Fair-Trade Australia New Zealand.
He has been Chair of Melbourne Water, the Australian Building Codes Board, President of the Australian Centre for the Moving Image (ACMI) and a director of the Australian Green Building Council.

He is a Co-Chair of the Leadership Council of the UN Sustainable Development Solutions Network (SDSN) launched by the Secretary General of the United Nations to provide expert advice and support to the development and implementation of the Sustainable Development Goals.

He is also the Chair of the SDSN Association, which operates the SDSN network around the world.

In 2013, John was named as one of the 100 Global Sustainability Leaders by ABC Carbon Express. John was appointed Member of the Order of Australia for significant service to the environment and to the people and Parliament of Victoria in the 2021 Australia Day Honours.

John Thwaites was Deputy Premier of Victoria from 1999 until his retirement in 2007. During this period he held various Ministerial portfolios including Minister of Health, Minister of Environment and was Victoria's first Minister for Climate Change.
He has degrees in Law (Honours) and Science from Monash University.
He is a Fellow Australian Institute of Company Directors.

## Dr Cathy Foley

AO PSM

Dr Foley was appointed Australia's ninth Chief Scientist in 2021, following a lengthy career at the CSIRO.

Dr Foley's scientific excellence and influential leadership have been recognised with numerous awards and fellowships, including being elected to the Australian Academy of Science in 2020, being named an Officer in the Order of Australia in 2020 for service to research science and the advancement of women in physics, receiving the Clunies Ross Medal of the Australian Academy of Technological Science and Engineering in 2015, and receiving the Australian Institute of Physics Medal for Outstanding Service to Physics in 2016.

She was elected as a Fellow of the Australian Academy of Technological Science and Engineering in 2008.

Dr Foley's previous roles include membership of the Prime Minister's Science, Engineering and Innovation Council, President of the Australian Institute of Physics, President of Science and Technology Australia, Editor-in-Chief of Superconductor Science and Technology journal, and a council member for Questacon.

## Vaughan Levitzke

PSM

Vaughan Levitzke was the CEO of Green Industries South Australia from 2017-2021 and developed the first state-wide five-year waste strategy and first circular economy benefit cost analysis, the first ban on plastic bags and then single use plastics.

Prior to his role at GISA, Vaughan established, and led Zero Waste SA. He also spent a decade with the South Australian Environment Protection Authority, focussing on regulation in the waste sector, litter, expanding container deposit legislation, eco-efficiency and industry sustainability.

He is the former chair of the Native Vegetation Council and former Chair of not for profit Circular 360. He is a member of Tyre Stewardship Australia, and several advisory boards. He is the founder of Circular Economy Advisory, a consulting company.

In 2015, Mr Levitzke was awarded the Public Service Medal for outstanding public service in the area of waste management reform and policy.

## Romilly Madew

AO

Romilly Madew is the CEO of Engineers Australia, a Fellow of the Australian Academy of Technology and Engineering and Director of the Sydney Olympic Park Authority and Placemaking NSW.

Prior to joining Engineers Australia, Ms Madew was CEO of Infrastructure Australia, and formerly served as CEO of the Green Building Council for 13 years.

Ms Madew is also an Honorary Fellow, Engineers Australia and Planning Institute of Australia, Honorary Fellow of the Australian Sustainable Built Environment Council, and Life Fellow of the Green Building Council of Australia. Romilly holds a Bachelor of Agricultural Economics.

## Dr Larry Marshall

Dr Marshall was Chief Executive of CSIRO, Australia's national science agency, from 2015 to 2023 – making him the longest serving CEO of the agency in the last 50 years.
While at the CSIRO Dr Marshall led the creation of the CSIRO Innovation Fund – Main Sequence Ventures. Since it was founded, Main Sequence Ventures has helped to build 42 deep technology companies, creating more than 1,200 technology jobs.

In 2020, Dr Marshall led the establishment of CSIRO's Missions program, bringing together research agencies, universities, industry, government and community to tackle urgent and complex problems facing the country.

Missions launched to date include Hydrogen, Future Protein, Drought Resilience, Trusted AgriFood Exports, Ending Plastic Waste, and Towards Net Zero.

Dr Marshall holds a PhD in Physics and became a global leader in laser research, for which he was honoured as a Federation Fellow and later as an Australian Academy of Technology and Engineering Fellow.

He has 100 publications and conference papers, holds 20 patents, and has served on 20 boards of high-tech companies operating in the US, Australia and China.

## Lisa McLean

Lisa is a circular economy and zero-carbon business transformation leader. She has over 20 years of experience in helping industry and governments develop new policy frameworks and regulations that support a circular zero-carbon economy.

Lisa works as the Chief Executive Officer at Circular Australia, an independent circular economy innovation body leading the transition to a zero-carbon circular economy in Australia. She has contributed to a number of government and industry advisory groups and committees focusing on policy reforms, standards and market levers to promote a circular economy i n Australia. Lisa is also owner and Director of Carbonwise Company, helping catalyse new circular economy markets and technologies in Australia.

Lisa has initiated the establishment of several peak organisations with the support of founding organisations, including Open Cities Alliance a peak association for next-gen infrastructure and the circular economy and the Australian Solar Thermal Association (AUSTELA). Lisa was in the founding team of Clinton Climate Initiative, working as London City Director. She started her career as a political journalist and holds a Bachelor of Arts in Politics and English from the University of Sydney.

## Samantha Read

FRACI GAICD

Samantha Read has been the CEO of Chemistry Australia since 2014. Her career spans more than 30 years across the chemicals, plastics, renewable fuels, automotive and steel industries.

Prior to joining the Association, she was CEO of the Biofuels Association of Australia and held senior executive and board roles at GM Holden and General Motors Australia and was a Non-Executive Director of the Federal Chamber of Automotive Industries.

Samantha has chaired and contributed to numerous government and industry boards and committees focused on policy development and implementation to drive growth and investment in Australian manufacturing.

These include current membership of CSIRO's Ending Plastic Waste External Advisory Committee, the Monash Industry Council of Advisors, and is a former non-executive Director of Manufacturing Skills Australia.

Samantha holds a Bachelor of Engineering (Hons.) in Materials Engineering from Monash University, is a Fellow of the Royal Australian Chemical Institute and Graduate of the Australian Institute of Company Directors.

## Dr John Spoehr

John Spoehr was formerly Pro-Vice Chancellor - Research Impact at Flinders University and Director of the Australian Industrial Transformation Institute. John led a multi-disciplinary team focusing on industry and workplace transformation in the context of technological change and innovation.

John has written extensively on economic and industry development, employment, unemployment and the socio-economic impact of change. He is Editor of 'State of South Australia', published by Wakefield Press and a columnist for the Adelaide Review.

He co-founded the Stretton Centre, a regional innovation facility in Northern Adelaide, in partnership with the City of Playford, the Government of South Australia and the Australian Government's Suburban Jobs Program in 2012.

He led the establishment of the Tonsley Manufacturing Innovation Hub and was founding Director of the Factory of the Future at the Tonsley Innovation District.

He is an Honorary member of the Leaders Institute of SA and a Patron of the Don Dunstan Foundation.

## Paul Klymenko

Paul is a systems thinker who is passionate about collaborating to create a world where humanity thrives in balance with nature. To this end he has worked in fostering sustainability for over 35 years with roles ranging from environmental research and behaviour change to socially responsible investment.

Paul has over a decade of experience in the finance industry during which in 1986 he co-founded Australian Ethical, Australia's first socially responsible investment manager with now over $9b under management.

He co-founded Planet Ark in 1992 and is presently a Board Member and its Chief Sustainability Advisor. Planet Ark has become one of Australia's most trusted and well-known environmental organisations through its highly successful initiatives.

He is the key instigator of their Australian Circular Economy Hub which aims to inspire the transition to a carbon neutral circular economy in Australia.

Paul also provides his expertise to a number of other sustainability focussed committees and boards.

## Claire Kneller

Claire Kneller is the Managing Director of WRAP Asia Pacific,

a not for profit focussed on the transition to a circular economy, especially for our food, clothing and plastic packaging. She also leads the delivery of the voluntary commitment programme for Stop Food Waste Australia.

Before joining WRAP, she worked at the UK's Accelerating Growth Fund, supporting high risk, technically innovative projects with commercial loans.

## John Gertsakis

John Gertsakis is an Adjunct Professor at the Institute of Sustainable Futures, and a Director of the Product Stewardship Centre of Excellence.

He is a sustainability and communications practitioner with over 20 years' experience as an industry adviser, consultant, advocate and research academic. He was a senior research associate at RMIT University's Centre for Design for 10 years.

John works on a range of issues covering product stewardship strategy, circular economy, sustainable product design, policy reform and regulatory analysis.

He served as Executive Director of Product Stewardship Australia from 2006 to 2011 representing global consumer electronics brands in the detailed development of the Product Stewardship Act 2011. John was also the Associate Director of the European Union-funded EcoSmart Design Program based in Belfast, Ireland from 2003 to 2006.

He conceived the EcoSpecifier product database for interior designers and architects in the 1990s and is an Honorary Fellow of the Design Institute of Australia. He is the director and co-founder of the Ewaste Watch Institute, a not-for-profit think-tank established to accelerate the sustainability of electronic products.

## Michael Jackson

Michael has worked at Downer, a civil Engineering and Construction company and the leading provider of integrated services in Australia and New Zealand, for over 9 years. His current role is as General Manager for Strategic Development for Road Services at Downer.

Michael is also President of the Australian Council of Recycling (ACOR), which is the leading national industry association for the recycling and resource recovery sector in Australia.

Michael began his career working as a Lawyer. He holds Bachelors of Commerce / Law from the University of Tasmania, as well as a Graduate Certificate in Applied Finance and Investment from the Financial Services Institute of Australia.

## Professor Robynne Quiggin

Professor Quiggin is a member of the Wiradjuri nation of central western New South Wales. She has practised as a solicitor and consultant for 15 years with a focus on legal, compliance and policy areas of relevance to Indigenous Australians including human rights, financial inclusion, financial services, consumer issues, governance, the arts and heritage.

She is also an Academic and Professor at the Business School of the University of Technology Sydney, as well as Chair of the Westpac Indigenous Advisory Committee and Board Chair of the Aboriginal Housing Office.

Robynne is skilled in small business, government, not- for- profit organisations, public speaking, teaching and facilitation. She has strong business development skills and governance knowledge. Robynne holds a Bachelor of Arts from the University of Sydney and a Bachelor of Laws from the University of NSW.

## Mark Rawson

Mark is a leading specialist in waste, recycling and resource management. He has qualifications in Chemical Engineering and an MBA. Mark has been practicing in the area of waste, recycling and resource management for over 20 years and is the National Vice President of the Waste Management and Resource Recovery Association of Australia.

He works as the Managing Director and Principal Consultant at Rawtec, one of Australia's leading waste, recycling and resource management consultancies. Prior to establishing Rawtec in 2007, he was the Regional Manager for Cleanaway for SA/NT.

## Dr Dominique Hes

Dr. Dominique Hes is an award-winning author, consultant, collaborator, researcher and academic working in the areas of regenerative development, placemaking, biophilia, urban greenery, sustainable development and all areas that look at using human ingenuity to address the messy, complex problems in our cities.

With degrees in Botany, Engineering and Architecture, Dominique brings an interdisciplinary approach, built projects, and governance experience to all her work. She was a founding Board member of the Living Future Institute of Australia (LFIA) serving from 2012 until 2015, she served as trustee at Trust for Nature board, was formerly the Zero Carbon Buildings Lead in the City of Melbourne, and is now the Chair of the Board of Greenfleet.

# **Appendix 3:** Circular economy key facts and figures

## State of circularity globally and in Australia

- According to the 2024 Global Circularity Gap report, global circularity is now **7.2%.**[27]
- Per capita, Australia has the **highest material footprint of the G20 and third highest of the OECD (behind Iceland and Ireland).**[28]
  - In 2019, Australia's material footprint was **46.82 tonnes per capita compared to the OECD average of 21.5 tonnes per capita.**
  - **A high material footprint means a country uses a lot of resources per person.**
- **Australia has the fourth lowest rate of material productivity in the OECD. We generate US$1.20 of economic output for every kg of materials consumed, under half the OECD benchmark of US$2.50.29**
- Per capita Australia generates **2.94 tonnes of waste, of which 60% is recycled.**[30]
  - Australia landfills more of its waste than other developed economies like the UK, Netherlands, Singapore and Japan (noting other countries do more energy recovery).
  - According to a DCCEEW study, every year **Australian firms spend $1.4 billion sending $26.5 billion worth of material to landfill**[31].

## Benefits of a circular economy for Australia

- KPMG has estimated that improving the way we use materials in the food, transport and built sectors alone could add **$210 billion to Australia's GDP by 2048.**[32]
- Modelling done for the UK showed that an increase in **resource productivity by 3% annually could translate to 7% GDP growth by 2030 compared to current practice, improve the trade balance by 1-2% of GDP, and, generate over 200,000 gross jobs to 2030.**[33]
- The World Economic Forum has identified the production and consumption of goods as a root cause of both climate change and biodiversity loss.[34]
- The 2022 Global Circularity Gap report modelled that **70% of emissions are associated with the way we make and use products, materials and food.**[35]
  - A circular economy helps avoid a portion of these emissions, by keeping existing materials in use and improving production efficiency. Like energy efficiency, better efficiency with our resources helps reduce energy demand.
- Waste arising from the net zero transition is expected to increase exponentially over the next 10 years. For example, Australian end-of-life solar panel waste is expected to increase by **17 times between 2019 and 2030.**[36]

27 The Circularity Gap Report 2024, 'The CGR Report 2024'', 2024.
28 OECD iLibrary, 'Environment at a Glance Indicators: Circular economy - waste and materials', 2024.
29 OECD iLibrary, 'Environment at a Glance Indicators: Circular economy - waste and materials', 2024.
30 Blue Environment, 'National Waste Report 2020 - Department of Agriculture, Water and the Environment', 2020.
31 DCCEEW, A study into commercial and industrial (C&I) waste and recycling in Australia by industry division (dcceew.gov.au) , 2021
32 KPMG, 'Potential economic pay-off of a circular economy for Australia', 2020.
33 Business in the Community Circular Economy Taskforce, 'Resource Productivity and the Circular Economy: The opportunities for the UK economy', 2018.
34 World Economic Forum, 'Here's how we can double the circular economy in ten years | World Economic Forum (weforum.org)', 2022.
35 The Circularity Gap Report 2022, 'The CGR Report 2022', 2022.
36 Product Stewardship Centre of Excellence, 'Progress in co-designing a national product stewardship scheme for photovoltaic (PV) systems', 2022.

- **More than 90% of the materials from renewable energy infrastructure can be used again when designed for reuse and recycling according to the European Environment Agency.**[37]
- It's estimated that every year in Australia about **130,000 tonnes of plastic leaks into our marine environment.**[38]
  - Over **800 species of fish, marine mammals and birds worldwide are affected by plastic pollution.**[39]
  - Pollution is the result of a materially inefficient economy.

## Governance, economics and investment

- **75% of the G20 have an overarching circular economy policy, strategy or framework – Australia does not.**
- **Circular economy themed investments are the third most common sustainability-themed investments according to the 2023 Responsible Investment Benchmark Report.**[40]
- In a survey by the Global Impact Investor Network (GIIN), more than **40% of investors mentioned sustainable production and consumption as a key theme for their investments.**[41]
- As of 2020, more than **190 banks representing US$50 trillion in assets have signed the six Principles for Responsible Banking, the first 3 of which stimulate the growth of circular economy finance.** [42]

## Built environment

- The built environment consumes **1/3 of global resources.**[43]
- **40% of landfill in Australia is construction waste.**[44]
- Construction and demolition waste in 2020–21 was **29Mt in Australia and is the largest (and growing) source stream of all materials received and processed in recycling and waste re-use.**[45]
- Recycled material could **replace 27% of virgin materials in road infrastructure.**[46]

## Circular design and consumption of products

- Manufacturing is responsible for about one-third of global greenhouse gas emissions and around 5% of global freshwater and land use[47].
- More than **80% of the environmental impact of a product is determined at the design stage.**[48]
- A recent CommBank consumer insights research report found **that 85% of Australians** are concerned about the total amount of waste and consumption in society, with younger consumers linking this issue directly with climate change[49].

37 European Environment Agency, 'Emerging waste streams: Opportunities and challenges of the clean-energy transition from a cicular economy perspective', 2023.
38 DCCEEW, 'National Plastics Plan summary', 2021.
39 World Wildlife Fund, 'Plastics | Initiatives | WWF', 2024.
40 Responsible Investment Association Australia, 'Responsible Investment Benchmark Report', 2023.
41 UNEP Finance Initiative, 'UNEPFI - Financing Circularity: Demystifying FInance for Circular Economies', 2020.
42 UNEP Finance Initiative, 'UNEPFI - Financing Circularity: Demystifying FInance for Circular Economies', 2020.
43 McKinsey and Company, 'Accelerating green growth in built environment', 2022.
44 Department of Climate Change, Energy, the Environment and Water (DCCEEW), 'National Waste Report 2022', 2022.
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47 The Circularity Gap Report 2024, 'The CGR Report 2024'', 2024.
48 Ellen MacArthur Foundation, 'An introduction to circular design', 2022.
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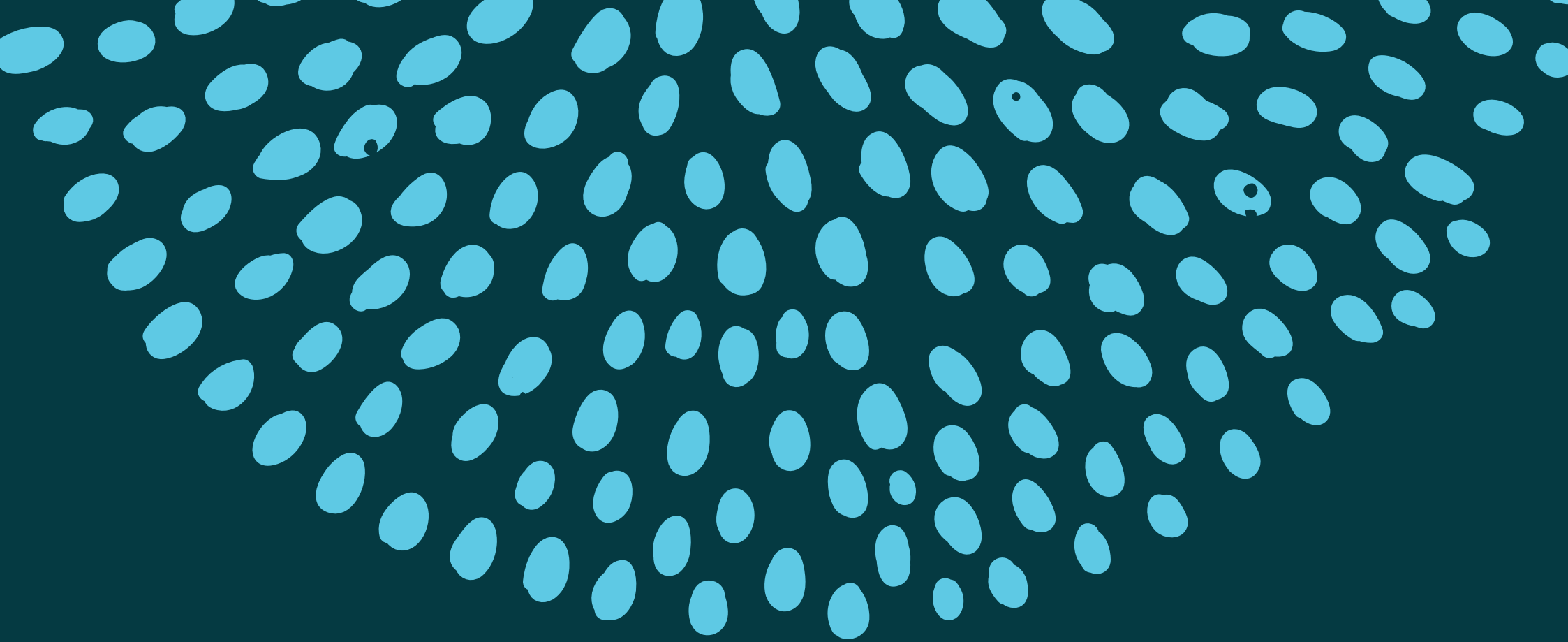

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