Transport and Infrastructure Net Zero Consultation Roadmap

Take the survey

Department of Climate Change, Energy, Environment and Water

Response received at:
July 17, 2024 at 2:52 PM GMT+10

Response ID:
sbm2f552109a377f36d80854

1 Confirm that you have read and understand this privacy notice.
Yes

2 Please indicate how and if you want your submission published.
Public

3 Published name
Australian Council of Recycling

4 Confirm that you have read and understand this declaration.
Yes

5 First name
Not answered

6 Last name
Not answered

7 Email
Not answered

8 Phone

Not answered

9 Who are you answering on behalf of?

Not answered

10 Organisation name

Not answered

11 What best describes you or your organisation?

Not answered

12 What sector do you represent?

Not answered

13 What state or territory do you live in?

New South Wales

14 Postcode

Not answered

15 What area best describes where you live?

City

16 1. Do you support the proposed guiding principles?

Not answered

17 1.1 Please add details to your response.

Not answered

18 2. Do you support the use of the avoid-shift-improve framework as a tool to identify opportunities for abatement?

Not answered

19 2.1 Please add details to your response.

Not answered

20 3. Do you agree the development of a national policy framework for active and public transport will support emissions reduction?

Not answered

21 3.1 Please add details to your response.

Not answered

22 4. What should be included in a national policy framework for active and public transport and how should it be developed?

Not answered

23 5. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the movement of people contributes to transport emissions reduction?

Not answered

24 6.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure that the movement of goods contributes to transport emissions reduction?

Not answered

25 6.2. How would these actions address the identified challenges and opportunities for emissions reduction in the movement of goods?

Not answered

26 7. Do you agree with the proposed net zero pathway for light road vehicles?

Not answered

27 7.1 Please add details to your response.

Not answered

28 8. The Australian Government is currently developing an Australian New Vehicle Efficiency Standard and has already begun to implement actions in the National Electric Vehicle Strategy.8.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce light vehicle emissions?

Not answered

29 8.2 How would these actions address the identified challenges and opportunities to reduce light vehicle emissions?

Not answered

30 9. Do you agree with the proposed net zero pathway for heavy road vehicles?

Not answered

31 9.1 Please add details to your response

Not answered

32 10. The proposed pathway for heavy road vehicles relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

33 10.1 Please add details to your response. Why did you rank them in that order?

Not answered

34 11. What role should low carbon liquid fuels play in the heavy vehicle

decarbonisation?

Not answered

35 12. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce heavy vehicle emissions?

Not answered

36 13. Do you agree with the proposed net zero pathway for rail?

Not answered

37 13.1 Please add details to your response.

Not answered

38 14. The proposed pathway for rail relies on a mix of battery electric, hydrogen fuel-cell and low carbon liquid fuels.Rank from 1 to 3, the order in which these should be prioritised for emissions reduction.

Not answered

39 14.1 Please add details to your response. Why did you rank them in that order?

Not answered

40 15. What role should low carbon liquid fuels play in rail decarbonisation?

Not answered

41 16. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce rail emissions?

Not answered

42 16.1 How would these actions address the identified challenges and

opportunities to reduce rail emissions?

Not answered

43 17. Do you agree with the proposed net zero pathway for maritime?

Not answered

44 17.1 Please add details to your response.

Not answered

45 18. The Australian Government is engaging in consultation as part of the development of the Maritime Emissions Reduction National Action Plan and those consultations will also inform the final Roadmap and Action Plan. 18.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce maritime emissions?

Not answered

46 18.2 How would these actions address the identified challenges and opportunities to reduce maritime emissions?

Not answered

47 19. Do you agree with the proposed net zero pathway for aviation?

Not answered

48 19.1 Please add details to your response.

Not answered

49 20. The Australian Government has already engaged in consultation on aviation decarbonisation through the development of the Aviation White Paper and those consultations will also inform final Roadmap and Action Plan.

Not answered

50 20.1 What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce aviation emissions?

Not answered

51 21. Do you agree with the proposed net zero pathway for transport infrastructure?

Not answered

52 21.1 Please add details to your response.

Not answered

53 22. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to reduce transport infrastructure emissions and ensure that transport infrastructure is ready for and enables low-emission transport modes?

Not answered

54 22.1 How would these actions address the identified challenges and opportunities to reduce transport infrastructure emissions?

Not answered

55 23. What additional actions by governments, communities, industry and other stakeholders need to be taken now and in the future to ensure the energy mix is ready to support transport emissions reduction?

Not answered

56 24. How should the use of low carbon liquid fuels (LCLFs) be prioritised across different transport modes over time to achieve maximum abatement?

Not answered

57 25. What are the best ways for the Australian Government to work collaboratively with industry, business, governments and communities to implement the proposed pathways?

Not answered

58 25.1 What are good domestic or international examples of partnership and collaboration on transport and transport infrastructure emissions reduction that could inform the final Roadmap and Action Plan?

Not answered

59 25.2 What opportunities can Government leverage to show leadership in Australia and internationally?

Not answered

60 26. What measures and metrics should be used to evaluate the final Transport and Infrastructure Net Zero Roadmap and Action Plan?

Not answered

61 26.1 What other data and evidence could governments use and how could this offer further insights on the pace, scale and location of transport emissions reduction pathways?

Not answered

62 27. Do you have any feedback on the proposed review process?

Not answered

63 28. Do you have any further feedback on the Consultation Roadmap and proposed pathways?

Not answered

64 28.1 Is there anything missing? Are the sections appropriately integrated? Is the Roadmap appropriately ambitious?

Not answered

65 29. Is there any further information or documentation that you wish to be considered with your submission?

Not answered

66 Would you like to upload a document?

Yes

67 Have you removed any identifying information from your submission?

Yes

68 Upload a submission

240711 ACOR - Transport and Infrastructure Net Zero.pdf

69 Upload a submission

Not answered

70 Upload supporting file

Not answered

71 Upload supporting file

Not answered

AUSTRALIAN COUNCIL OF RECYCLING

Level 23, 520 Oxford Street
BONDI JUNCTION NSW 2022
admin@acor.org.au
www.acor.org.au
ABN: 60 574 301 921

11 July 2024

Department of Infrastructure, Transport, Regional Development, Communications and the Arts
GPO Box 594
CANBERRA ACT 2601

via: NetZero@infrastructure.gov.au

To whom it may concern

Transport and Infrastructure Net Zero Consultation Roadmap

The Australian Council of Recycling (ACOR) welcomes this opportunity to comment on ways to decarbonise transport infrastructure and fuels through the use of recycled materials.

ACOR is the peak industry body for the resource recovery, recycling, and remanufacturing sector in Australia. Our membership is represented across the recycling value chain, and includes leading organisations in advanced chemical recycling processes, CDS operations, kerbside recycling, recovered metal, glass, plastic, paper, organic, tyre, textile, oil and e-product reprocessing and remanufacturing, and construction and demolition recovery. Our mission is to lead the transition to a circular economy through the recycling supply chain.

Achieving net zero for transport and infrastructure requires a shift towards a circular economy, where recycling plays a vital role by reducing reliance on virgin resources, maximising resource efficiency, supporting local production and minimising waste.

As an integral gear within the circular economy, the Australian recycling industry contributes almost $19 billion in economic value, while delivering environmental benefits such as resource efficiency and diversion of material from landfill. One job is supported for every 431 tonnes of material recycled in Australia. The industry operates across our homes, businesses, factories and construction sites. It collects, sorts and reprocesses material, and makes new products with recycled content, creating more jobs for Australians.

Recycled materials also support decarbonisation, with the potential for over 1.8 million tonnes of avoided emissions per year in NSW alone; metals offer particularly strong abatement opportunities.

The policy environment for circular economy and recycling in Australia is rapidly evolving, with a broad range of national initiatives, including the implementation of climate change targets, the *Recycling and Waste Reduction Act 2020*, an export ban on recyclable materials, the National Waste Policy and Action Plan, the National Reconstruction Fund, a national commitment to a circular economy, the convening of a Circular Economy Ministerial Advisory Group, and a commitment to regulate packaging design.

The circular economy is a much bigger system than recycling; however, every product eventually reaches an end of use, no matter how resource efficient, repairable and reusable. Recycling is the critical link that closes the loop in a circular economy.

1. Policy overview

In October 2022, Australia's Environment Ministers committed Australia to achieving a circular economy by 2030, by designing out waste and pollution, keeping materials in use longer and fostering end markets for recycled material. Every available lever will be needed to achieve this transformation, particularly in light of the fact that Australia is currently falling short in progressing key targets in the National Waste Action Plan, which include:

- reducing the total waste generated in Australia by 10% per person by 2030
- achieving an 80% average recovery rate from all waste streams by 2030
- significantly increasing the use of recycled content by governments and industry
- halving the amount of organic waste sent to landfill by 2030.

The 2022 National Waste Report found recovery rates for household waste have stagnated while commercial and industrial waste recovery rates have declined.

Since 2020, Australia has restricted the export of unprocessed recyclable materials including glass, tyres, plastic and paper, under the *RAWR Act 2020*, which also provides a framework for voluntary, co-regulatory and mandatory product stewardship. It is therefore imperative to ensure necessary infrastructure exists to transform these recovered resources into higher value commodities, and that there are viable and robust domestic and international markets.

2. Delivering strong recycling outcomes

A local circular economy can bolster sovereign capabilities and reduce supply chain vulnerabilities—especially for low-embodied energy materials in infrastructure projects. This necessitates a national economic transformation, fostering new recycling infrastructure and remanufacturing for these critical materials.

It must be recognised that the recycling system is essentially comprised of three key elements: collection, processing, and end markets. Each of these elements is vital for real recycling outcomes—and each must be economically viable. A most pressing priority for recyclers is access to dynamic markets, without which the entire recycling system cannot be viable.

Recycling must be distinguished from waste management. While historically, the two sectors were tied, as businesses integrated waste and recycling, in fact these processes are distinct: waste management is a logistical enterprise, whereas the recycling value chain is production, comprising aggregation and sorting, reprocessing and remanufacturing. Recycling processes are often dependent on effective logistics provided by the waste management sector, which transports and disposes of waste and unwanted materials. But, fundamentally, waste entails pollution and risk, whereas recycling offers resource efficiency, value creation, economic opportunity and circular outcomes.

Particular challenges to stronger investment in recycling are the complex and fragmented regulatory environment across the country, the low cost of landfilling which diverts material away from recycling, the relatively low value of recovered material, cost competitiveness with virgin materials, and willingness within the supply chain to embrace change.

Targeted funding is an important lever to enabling the significant scale required to address these barriers, and as such, funding deployed through the Recycling Modernisation Fund is welcome and necessary. However, strong markets and aligned regulatory frameworks must also be addressed. Importantly, the Australian Government must prioritise a nationally harmonised regulatory framework for resource recovery and recycling.

3. Procurement of recycled materials

As Australia's largest infrastructure client and major procurer of goods, governments have a key role to play in leading market demand for recycled content. There are significant opportunities to replace or supplement virgin materials, including but not limited to quarried aggregates, bitumen, plastic, imported crumb rubber with recycled materials, improving resource efficiency and drawing less from virgin sources. However, despite procurement policies that prioritise recycled materials, there are persistent barriers that impede uptake.

For recycling systems to be viable, there must be robust, sustainable domestic markets for recycled materials. Procurement needs to be significantly scaled up, in order to properly kickstart supply chain integration of recycled products and materials and establish robust and resilient end markets. As things stand, there is very low uptake of recycled rubber, glass and soft plastics in road base around Australia, for example.

While recycling is a manufacturing enterprise, unlike other parts of the manufacturing industry, recyclers cannot control the volume or the quality of the material that reaches our facilities: that is dependent on consumption and production patterns, systems for collecting and managing waste, and how the community engages with these systems.

Meanwhile, state-based environmental regulation strictly controls the nature and volume of material stored at recycling facilities, which means material can't be stored in a facility for long and must keep moving. At the same time, markets for recovered materials have narrowed, with the implementation of export bans on recovered plastic, tyres, glass, and forthcoming regulation on the export of recovered paper.

4. Specifications and standards

Systemic and cultural change is required in government procurement, with the understanding that different departments are responsible for specifications and procurement. Sustainability policies set by policy makers are not filtering down to officers who administer tenders. Government procurers are generally not trained or incentivised to try new materials, while virgin materials offer a lower risk profile. Under-resourcing across procurement divisions and also regulatory agencies has led to a long decline in technical capability, where a less technically proficient staff lacks the confidence and appetite to do tread new ground in resource recovery.

Furthermore, procurement of major infrastructure is undertaken at the state level, however States are often unable to compete salary-wise with industry or even Federal roles, resulting in further skills shortages. Also, ever-increasing government reliance at all levels on consultants has meant that governments have been largely outsourcing technical skills, retaining generalists internally.

Another barrier to uptake of recovered resources in the built environment is 'fitness of purpose' and procurement standards contracts. Government tendering processes disincentivise innovation. Procurement processes for government road authorities are convoluted in every state: for example, the procurement manual for South Australia's Department for Infrastructure and Transport is 600 pages long.

Case Study 1. ecologiQ

Victoria's Recycled First policy has proven to be an effective enabler for procurement of recycled content for infrastructure projects; more so than, for example, the 'If not, why not' policy applied in NSW. To a large part, this can be attributed to the requirement for all tenderers on Victorian major transport projects to demonstrate how they will optimise the use of recycled and reused materials at the levels allowed under current standards and specifications.

However, Victoria's ecologiQ program, the delivery mechanism for Victoria's Recycled First policy, has also been critical to building capability and confidence in procurement of sustainable and recycled materials. The program connects big infrastructure projects with those producing recycled material, facilitating communication between industry and departments, and challenging why recycled materials can't be used.

ecologiQ supports innovative procurement methods that might otherwise be perceived as entailing risk by acting as a matchmaker: working to understand concerns by procurement managers about using recycled resources, and soliciting data and testing from industry to demonstrate how materials comply. In verifying recycled products by enabling these tests and demonstrating results, ecologiQ is building confidence with government procurers, which will flow on to industry.

This model works by methodically changing the behaviour of key decision makers. In explicitly 'de-risking' procurement of sustainable materials by sharing perceived risk across organisations, decision-makers can take first steps together. ecologiQ is helping to change the behaviour of key decision makers to encourage adoption of recycled materials.

Ultimately, this program can help to inform mandatory targets for procurement of recycled material, as evidence is gathered in a voluntary context.

There is also a cost parity issue, where recycled content can be more expensive because it is locally manufactured. Furthermore, requirements that tenders go to a broad market rule out many newly developed recovered resource products which will typically have only one provider—as will remain the case where there is a lack of end markets and market competitiveness.

The engineering technical fraternities in specification and research bodies can also be risk-averse and resistant to change. Specifications can harness or hinder change: federal specifications provide an opportunity to effect top-down change, as states and territories follow federal requirements, and local governments follow the states and territories.

Case Study 2. Standards Australia

A joint report between Standards Australia and ACOR, 'Standards to facilitate the use of recycled material in road construction', offers recommendations to increase recycled content in roads:

• Recommendation 1: The Australian Government, Standards Australia and key industry expert participants should collaborate to modify existing and/or create new performance-based Australian Standards that harmonise the inconsistencies in existing specifications.

• Recommendation 2: Standards Australia, the Australian Government, the construction and recycling sectors, and circular economy leaders must continue to work together to provide practical guidance for the use of recycled materials in roads and the associated enabling standards.

Case Study 3. Carbon savings from using reclaimed asphalt pavement (RAP) products

While 10,000 tonnes of virgin hot mix AC14 asphalt generates 800 tonnes of CO_2 emissions, using reclaimed asphalt pavement (RAP) can lower the embodied greenhouse gas emissions in roads, from a saving of 89 tonnes of CO_2 emissions with a 20% mix of RAP, up to between 222 and 255 tonnes of CO_2 emission savings at 50% RAP.

Recovered materials may also outperform traditional virgin materials in roads: performance testing of Downer's recycled road product Reconophalt™ has shown up to 65% improvement in fatigue life, and superior deformation resistance under heavy vehicular traffic.

Unless there are firm KPIs, reports on progress, and consequences for not meeting targets, government procurers will continue to choose virgin materials: there must be clear procurement targets, by weight/volume, for use of recovered materials, with transparent and timely reporting on progress.

Green building and infrastructure rating tools provide an excellent incentive for uptake of sustainable materials; however, they should also be tightened to deliver meaningful recovered resources uptake. Requirements must be scaled according to the weight and volume of large infrastructure projects, and not traded away for small volumes of recycled materials or education campaigns.

The case studies below are a few instances of many where recovered resources meet performance requirements but are nevertheless persistently rejected on the basis of trivial or outdated specifications, general reluctance and lack of motivation.

Case Study 4. APA Group: bedding sand

Gas pipeline infrastructure owner APA Group still requires that bedding sand must be a virgin resource. Recyclers have sought to engage various APA stakeholders to explore broader reuse opportunities, without response. Recycled products are able to meet technical properties; however, the specification states the bedding sand needs to be yellow to white, and from an approved source: recycled materials can't comply with colour specifications.

Case Study 5. Citipower/Powercor: embedment and backfill sand

Although recovered resource products meet the technical properties of the required specification, Citipower's specification explicitly states the sand must be natural sand (such as river sand). Powercor's technical standards team have been contacted numerous times, without response.

Case Study 6. Melbourne Retail Water Agencies / Water Services Association / Yarra Valley Water

Although some recycled materials are permitted for use with YVW and other water authorities, they are restricted to embedment applications and/or trench backfill for sewer projects only, not potable nor non-potable water systems. There has been a demonstrable lack of interest from such companies in adopting further recovered resources.

5. A nationally harmonised regulatory framework: Australian Resource Recovery Code Board

The stated goal of all of Australia's environment ministers is to move to a circular economy by 2030, however, the right regulatory balance has not yet been struck between mitigating the risks of waste and unleashing the benefits of recovered resources. There is a fundamental lack of alignment between environmental policies and circular economy principles, hindering the ability to maximise resource recovery.

The recycling sector also faces a fragmented, variable and duplicative regulatory environment across Australia's States and Territories, which undermines investment confidence in recycling infrastructure. Policies relating to resource recovery and recycling must be developed transparently and in collaboration with industry and broader stakeholders, supporting robust health and environmental outcomes, social license, and investment confidence.

Another necessary regulatory measure is a nationally consistent definition of 'end of waste'. A circular economy cannot advance if recovered resources are enduringly defined and managed as waste even after being adopted for reuse in other markets: the 'once waste, forever waste' outlook is a relic of a linear economy approach. Often, regulation classes waste as simply another pollutant that must be regulated, rather than a resource from which social, economic, and environmental benefits can be derived. This is not a regulatory starting point from which a circular economy can be effectively encouraged and must be addressed in a nationally harmonised way.

Once a business has invested in developing and manufacturing a recovered resource that has found acceptance with consumers, the safety of that product should be regulated by general consumer and product liability law along with relevant industry standards and other legislation. Theoretically speaking, the category of waste should be applied as a last resort in a circular economy context, after all resource recovery avenues have been exhausted, rather than as an initial classification. In particular, materials that have undergone processing should be given the same designation as manufacturing outputs.

Manufacturers of recycled products must be able to make these products in the first instance, to be available to market: environmental regulators place tight controls on storage at recovered resource sites, with little or no flexibility, despite the fact that the recycling sector often has little to no control over the volume or timing of feedstock. Furthermore, tight storage controls mean that meeting the requirements to bid for large infrastructure projects is difficult or impossible. When approvals for temporary larger storage are granted, they are often months too late because regulators are under-staffed and under-resourced.

Another critical focus for compliance and enforcement must be rogue unlicensed operators. Legitimate recyclers who strive for full compliance operate at a competitive disadvantage to unlicensed, noncompliant operators, creating an uneven playing field.

The impression from recyclers is that regulators focus on minor or point-in-time infractions from businesses already striving for compliance, while non-compliant rogue traders operate with impunity. There must be much stronger enforcement to address unlicensed operators, as well as better transparency about actions undertaken by Environmental Protection Authorities in relation to rogue and illegal activities, to build confidence among legitimate operators.

The main regulatory challenges are as follows:

- While the waste management hierarchy objectives are enshrined in legislation across Australian States and Territories to encourage resource recovery and recycling, the mechanisms to lawfully implement such opportunities are the regulatory exception rather than the rule.
- There is a misalignment between environmental protection objectives on the one hand, and circular economy objectives on the other, whereby many recoverable resources are regulated as industrial or regulated wastes that present a contamination risk, rather than prioritised as resource that, with appropriate de-contamination management, presents an economic opportunity and a necessary part of the circular economy supply chain.
- There is a focus on regulation of materials at the 'end of use' to address resource recovery and recycling requirements, rather than working across the full supply chain.
- Policy priorities and settings for resource recovery and recycling across Australia are fragmented and uncertain, particularly across industry sectors.

- Industry is not consistently at the table in regulatory decision-making processes, undermining investment confidence and practical solutions.
- Voluntary and regulated product stewardship models are not progressing efficiently or effectively to meaningfully support circular economy objectives.
- Regulatory processes for resource recovery and recycling are not aligned and opportunities to address this via regulatory impact assessments are often not available where this process is not followed. In turn, this creates uncertainty in the regulatory settings which discourages large-scale investment.
- The regulatory imbalance between raw/virgin materials and recovered/recycled materials has stifled circular economy outcomes for waste material. Exploring opportunities to facilitate broader circular economy outcomes would encourage greater investment in the resource recovery and recycling sector.
- The uncertainty and long timeframes associated with the development/redevelopment of resource recovery and recycling facilities has suppressed innovation, increased costs and created significant barriers to entry.
- Inconsistent waste levies across different jurisdictions and between regions result in landfill often being more economical than resource recovery or recycling. The opportunity exists to reform waste levies to more effectively incentivise resource recovery and recycling.

Substantive and structural reform is required to achieve broadly shared circular economy objectives and also unlock the deep decarbonisation opportunities within a well-functioning circular economy.

A necessary step in national reform is the establishment of an Australian Resource Recovery Code Board (ARRCB), based on the model of the Australian Building Codes Board (ABCB), to deliver a nationally harmonised framework for resource recovery and recycling. This framework should sit under a portfolio for industry and economic development, rather than environmental protection.

The proposed ARRCB's work would be underpinned by a nationally applied definition of 'end of waste', to provide certainty about when a material is a resource versus a waste. The proposed ARRCB should also oversee an aligned and consistent approach to product stewardship, including container deposit schemes, with the priority of advancing circular economy outcomes.

The existing ABCB provides a relevant governance model for the proposed ARRCB, as it incorporates several key elements that will be essential in delivering a nationally harmonised, sustainable, economically viable and whole-of-supply-chain approach to resource recovery and recycling.

For example, this governance model will:

- provide a stable, nationally harmonised resource recovery and recycling framework to improve investment confidence and growth in the sector, while building community trust and ultimately supporting a balanced regulatory playing field between recovered and raw/virgin materials;
- enable the development of consistent definitions for waste and resource recovery, and incentivise the creation of Australian Standards, which can be reflected into State and Territory legislation;
- appoint industry representatives to the Board to ensure a broad range of perspectives, resulting in practical, economically viable and sustainable measures;
- ensure that regulatory processes for resource recovery and recycling are aligned with best-practice regulation, to support policy stability and encourage innovation and scaled investment;
- inform decision making relating to resource recovery and recycling infrastructure to address approval timeframes for development/redevelopment of facilities;
- determine the application of waste levies across jurisdictions and between regions to incentivise resource recovery;
- operate in parallel with other national bodies, including the ABCB, the National Environment Protection Council and Safe Work Australia, to coordinate management and reuse of recovered materials impacted by contaminants; and
- work with industry, across supply chains, to address circular economy issues and inform product stewardship regulation, as well as strong markets for recycled content.

6. Contamination: asbestos and chemicals of concern

Construction and demolition recycling yields a high rate of resource recovery, with a national average of around 80 per cent. While there is strong potential for even higher recycling rates, a risk to the sector is the presence of contaminants such as asbestos. The presence of such contaminants necessitates the diversion of recyclable material to landfill—ultimately a waste of recoverable resources.

The objectives of resource recovery and a circular economy are also undermined by thresholds set in State environmental regulations, which, for example, set unfeasibly low tolerances for contamination in waste categorisations, preventing recovery while doing nothing to prevent the accumulation of contamination through the supply chain. Regulating contaminants at 'end-of-pipe' assigns such burdens to the resource recovery sector rather than responsible parties who produced the contamination in the first instance.

In the construction and demolition recycling supply chain, for instance, there are clear opportunities to reduce asbestos contamination through closing regulatory gaps. Some such approaches are as follows:

- Harmonisation: consistent risk-based thresholds for asbestos contamination between regulatory authorities and across jurisdictions for both soil and construction & demolition streams.
- Improved tracking: a system to track demolition projects, waste movement, and rejected loads, and consider establishing a register of rejected suppliers.
- Strengthened enforcement: collaboration between environmental, workplace safety and building regulators to improve compliance checks and deter illegal practices.
- Standardisation: clear and consistent standards for asbestos identification, sampling methodologies and soil assessments.
- Industry education: training for demolition contractors and resource recovery workers on proper asbestos management practices.

Controls on contamination must be also applied consistently across the economy. State-level controls regarding chemical concentrations and applications, for example, are in some places applied to recovered resources but not materials from virgin quarries, which would have the same levels of naturally occurring metals. Virgin and recovered resources require a level regulatory playing field. Testing and monitoring requirements for PFAS levels must be uniformly applied to all materials applied to land: virgin/raw products as well as recovered resource equivalents. Given the likelihood of PFAS being present across the board, including in chemical fertilisers, pesticides, and herbicides, a uniform approach is imperative.

Decisions about contamination thresholds must be nationally harmonised, with transparent and evidence-based decision-making. Industry needs transparency and certainty, for example, in deciding what sensitivity of testing equipment to invest in—and whether the methods are both technically and economically feasible. Where thresholds for contaminations are set very low—for example, to the absolute presence or absence of contaminants—this may not be feasible. The obvious perverse outcome: where thresholds are set very low, materials will go to landfill.

7. Green metals

The recycling sector produces significant low-carbon recycled resources for the Australian economy. The National Waste Report 2022 shows that the recycling sector recovered 87% of the 5.71 Mt of metal waste generated in Australia in 2021–2022, providing 4.97 Mt of recycled metals to the global circular economy.

It is estimated that 2 million tonnes of processed ferrous scrap metal feedstock is used in domestic steel mills annually, amounting to 33% of current new steel output. Representations from the steel industry indicate that this may lift to 45%. Processed ferrous scrap metal is therefore a critical material for the Australian steel industry.

Australia currently exports over 1 million tonnes of unprocessed scrap metal annually, mostly in the form of end-of-life cars and white goods, which also comprise of waste materials such as glass, plastics, textiles, and tyres. This practice diminishes the potential for domestic steel production, facilitates the export of over 267,000 tonnes of waste, and increases carbon emissions through long-distance transportation.

Global competition for scrap metal is expected to increase. Many global competitors for scrap metal have lower labour, waste disposal and utility costs compared to Australia—as well as less stringent environmental standards that would likely fall short of community expectations of how Australian waste

should be managed. Increasing exports of unprocessed scrap metal are to the detriment of the Australian metal recycling and steel making industries, and general environmental outcomes.

Based on ABS data, as much as 1,070,575 tonnes of unprocessed ferrous scrap metal is exported per annum, with anecdotal evidence that it is rapidly increasing. To replace the volume lost through export, the Australian steel industry is either importing processed ferrous scrap metal, or relocating it domestically at great cost.

A ban on the export of unprocessed scrap metal can support a much better outcome for Australian-made green steel. A study led by the National Waste and Recycling Industry Council (NWRIC) has identified that an export ban on unprocessed scrap metal would mitigate approximately 81,110 tonnes of CO2 equivalent emissions annually, as well as bolster the local recycling industry—supporting the goal of green industries in Australia.

Moreover, recycling ferrous scrap metal saves an additional 1.2 million tonnes of Australian greenhouse gas emissions, compared to the use of virgin raw materials. This shift towards local processing not only supports sovereign steel manufacturing capability but also aligns with global sustainability initiatives by reducing carbon footprints associated with waste exports.

Securing scrap metal feedstock will also help to encourage the construction of electric arc furnace steel mills under consideration in Australia, which would be reliant on the supply of high-quality, furnace-ready scrap metal to operate. Without certainty of supply, the business cases for these proposed green steel mills will be significantly compromised.

Similarly, banning the export of unprocessed end-of-use electrical and electronic equipment (e-waste) would responsibly manage Australian waste while deriving environmental and economic benefit from the capture of green metals and critical metals therein.

ACOR joins NWRIC and the Australian Steel Institute in calling for a ban on the export of unprocessed scrap metal, noting that the Australian Government must first reform the waste export process to ensure that the regulation of waste export properly distinguishes between unprocessed waste and processed recycled commodities.

ACOR has been a strong advocate for the implementation of regulation on the export of waste. There are, however, lessons to be learned from Australia's leadership position relating to waste export. Rules underpinning the *Recycling and Waste Reduction Act 2020* (the *RAWR Act*) ban the export of 'waste material' such as unprocessed recovered glass, tyres and plastic—unless an exemption is granted at Ministerial level. However, a license is also required to export *processed* recycled commodities derived from these waste materials.

These Rules—particularly as they relate to licensing for the export of processed recycled material—are not fit for purpose. The current approach results in the treatment of manufactured materials as waste, adding cost and delay to the trade of recycled commodities and fundamentally undermining investment in domestic recycling infrastructure, including hundreds of millions of dollars contributed by governments through the Recycling Modernisation Fund.

The *RAWR Act* must be reviewed to clearly define an 'end of waste' and ensure that recycled commodities are distinguished from waste. Once this is accomplished, the scope of waste export regulations should be expanded to include unprocessed scrap metal and unprocessed e-waste.

State-based waste levies are also a significant cost for metal recyclers, and an appropriately designed levy system addressing metal recycling residuals, along with extended producer responsibility, is required to avoid the risk of lower recovery rates for some scrap metal goods (see Case Study 7 below). There are currently no scaled or viable offtakes for many items in metal recycling streams, such as mixed plastic residuals from e-waste, whitegoods and cars. Recyclers of these products must be supported to remain commercial now, while innovation is progressed to lift recovery rates in the future, and EPR is enacted to ensure producers bear the cost of low-value, unrecyclable materials. If the levy on shredder floc residuals is high enough, some recyclable items, such as fridges, will become uncommercial to recycle.

A differentiated levy exemption for metal recycling residuals in this part of the sector is an important consideration. The exemption should be based on a high degree of recovery to distinguish and reward best-

practice recyclers. At the same time, care must also be taken to ensure that such an approach does not incentivise leakage of recyclable material in construction and demolition recycling and commercial and industrial recycling.

Case Study 7. Metal recycling—global markets and domestic levies

Global market disadvantage

Metal recyclers operate in a global marketplace in which prices and commercial terms are dictated by international trade, not just domestic competition. This means that local steel mills often offer prices based on global factors.

The problem arises when state-based waste levies—unrelated to prices set by global supply and demand—artificially increase recyclers' costs.

These levies create an uneven playing field. Local recyclers incur these extra costs, while their exporting competitors do not. This creates a situation where:

- Suppliers face a choice: accept lower prices for local processing or export unprocessed metal and avoid the levy.
- Waste disposal costs (including levies) become too high: when local disposal costs exceed export logistics, an arbitrage opportunity emerges—it becomes more profitable to export than recycle.

This disadvantage is unique to trade-exposed recyclers. Other recycling facilities, like those processing organics or construction & demolition material, operate in domestic markets. They can simply pass the levy on at the 'gate' to domestic suppliers: in a closed domestic market, everyone faces the same costs.

High levies can hinder recycling of certain products

High processing costs, waste levies, and disposal fees can also make recycling certain products uneconomical. For example, NSW's waste levy is a major expense for metal processors. White goods, while offering a 50–60% metal recovery rate, also come with a 40–50% waste load. The levy on this non-recyclable portion becomes a significant cost.

Without mandated extended producer responsibility (EPR) schemes—where manufacturers share the disposal costs—high waste levies will discourage metal recyclers from accepting these products. The unintended consequence would be a higher, not lower, diversion of these products to landfill.

Case Study 8. TSR Recycling, Germany

An innovative remanufacturing process developed by TSR Recycling will reduce CO_2 emissions and energy use in steel production, while reducing dependence on raw materials. Their plant at Duisburg will process 450,000 tonnes per year of cars, mixed scrap or large household appliances, and deploy newly developed measuring, detection and separation techniques to remove contamination before remanufacturing.

E-waste should also be supported as a growing and valuable source of green metals. While the ban on exporting low-value unprocessed plastic waste has led to investment in onshore processing capacity, Australia currently lacks the infrastructure to recover raw materials contained in e-waste and batteries at a sufficient scale.

Electronic and electrical product (e-product) recycling is typically a process of size reduction and separation. As technology improves, electronic and electrical consumer goods componentry grows smaller, and finer shredding is required to separate materials for recovery. Along with decarbonising their own energy use at facilities, recyclers contribute to decarbonising the supply chain for metals through finer disaggregation as well as better sorting, leading to the cleanest possible materials being processed in foundries.

For example, advanced sorting of aluminium fractions, through laser-induced breakdown spectroscopy, can enable recycled aluminium to be used directly in a primary foundry, skipping the secondary foundry and reducing the embodied emissions of the end product. These sorting technologies represent opportunities for investment in Australia.

E-waste contains steel and aluminium, as well as batteries, printed circuit boards and other valuable fractions that contain abundant quantities of critical minerals. The value of critical minerals in one kilogram of e-waste is many hundred times that of an equivalent mass of mining ore and this feedstock should be domestically processed—not exported or landfilled—to realise investment in recycling infrastructure and carbon benefits.

Case Study 9. Mint Innovation—'Green gold'

Mint Innovation have established a world-first bio-refinery to recover gold and other critical minerals from printed circuit boards. Gold recovered from e-waste in their new facility in Sydney saves 90 per cent of the carbon emissions of newly mined gold.

Recovering these highly valuable raw materials through recycling processes will help ensure supply chain security of critical minerals for local development of battery and clean energy technologies. The recovery and refining of critical minerals from e-waste and batteries presents a clear opportunity for onshore value-add in a critical and strategic industry, as well as for the Australian Government to demonstrate global leadership in the safe and environmentally responsible refining of potentially hazardous materials.

Expanding e-product infrastructure would grow capacity, secure a supply of green metals and critical minerals and resolve an environmental challenge.

Case Study 10. SK Tes—coking coal innovation

With the SMaRT Centre at UNSW, and a grant from the NSW Environmental Trust, electronics recycler SK Tes (formerly Tes-Amm) worked with Newcastle-based steel maker MolyCop to develop a process for using toner and waste plastic as a replacement for coking coal in steel manufacturing. The project proved the concept, which could support an economical proposal when administered by a metal manufacturer.

8. Waste-derived fuel

For transport modes that are hard to electrify and have fewer alternatives to replace the use of liquid fuels, waste-derived fuel should be supported as part of the suite of renewable fuel options that can progress the transition to net zero.

All levers will be required to get to net zero: to achieve this transformed economy and society, the focus should be on achieving a cumulative balance of zero or negative emissions across all activities and products, rather than ensuring that every individual activity or product achieves zero or negative carbon emissions. Waste-derived fuel has a lower emission profile than fossil fuels while also avoiding the pressure on land use that biological-based fuels can create—supporting both resource efficiency and emissions reduction.

Assessments of biological-based fuels and waste-derived fuels should be made on the basis of complete life-cycle assessments. As yet, the potential for recycling and resource efficiency to contribute to emissions reduction and the path to net zero has not been fully harnessed. The National Greenhouse and Energy Reporting (NGER) Scheme and the safeguard mechanism currently overlook life cycle assessments. As such, only landfill gas capture and organic recycling are regarded as emission reduction activities in waste and recycling, limiting broader recognition of the recycling sector's contribution to a net zero future.

For example, 84% of Australia's waste engine lubricant oil is currently burned in Australia or overseas. If the oil were re-refined instead, 1 million tonnes per annum of greenhouse gas emissions would be avoided, while creating a product with 60 per cent less embodied energy than the virgin equivalent.

Case Study 11. Southern Oil

Southern Oil, through its wholly owned subsidiary SynBio, is working with the CSIRO to produce sustainable hydrogen via a combination of steam over iron reforming and chemical looping combustion technologies. The propriety process uses waste gases (such as those generated by Southern Oil's refineries) to produce cheap and sustainable hydrogen. After five years of research, design, and independent evaluation, Southern Oil has approved the design and build of a ten-kilogram-per-hour pilot plant. If successful, scaling and commercialising this process will result in significant emission reductions that could deliver better life-cycle results than green hydrogen.

Case Study 12. Tyre-derived fuel

End-of-life tyres present both a waste management challenge and an opportunity for resource recovery. Tyre-derived fuel provides an alternative energy resource to replace fossil fuels such as gas, coal or oil in industrial applications such as cement kilns, electricity generation or industrial process heat. It is estimated that 150,000 tonnes of tyre-derived fuel avoids 174,000 tonnes of carbon-dioxide emissions compared to brown coal. The greenhouse gas emissions savings from tyre-derived fuel are favourable when compared against several biological fuel sources: like biological-based fuel, there are emissions costs associated with refining and transporting tyre-derived fuel. However, unlike biological sources, there are significant emission savings that come from unlocking the steel and carbon black in tyre stockpiles, rather than sending to landfill and putrefaction.

Policy regarding renewable fuels should also align with international best practice, particularly regarding sustainable aviation fuel. Policy should be consistent with the internationally recognised Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) framework, administered by the International Civil Aviation Organisation, which recognises waste-derived aviation fuel as a sustainable aviation fuel that meets the CORSIA sustainability criteria.

9. Conclusion

There is much potential for our industry to grow and thrive, supported by a range of Government initiatives, that will not only unlock barriers to decarbonising transport infrastructure through recycling, but also deliver jobs, advance resource efficiency and unleash innovation and productivity in Australia's circular economy.

ACOR's members bring considerable real-world resource recovery and recycling expertise, based on operating in every jurisdiction in Australia and internationally, and we would be very pleased to facilitate further dialogue and consultation on the above matters. Should you have further queries, please do not hesitate to contact me via ceo@acor.org.au.

Yours sincerely

[redacted]

Suzanne Toumbourou
Chief Executive Officer