# Review of standards and specifications for recycled content products

## Environment Protection Branch

## Department of the Environment and Energy

EQUILIBRIUM

59 Stubbs Street,
Kensington, VIC 3031
+61 3 9372 5356

194 Varsity Parade,
Varsity Lakes QLD 4227
+61 4 04 899 961

Web – equil.com.au
Email – info@equil.com.au

# Table of Contents



# Tables and Figures



| | |
|---|---|
| **Client** | Department of the Environment and Energy |
| **Client contact** | Paul Starr |
| **Date** | 11 September 2019 |
| **Prepared by** | Damien Wigley and John Gertsakis |
| **Reviewed by** | Nick Harford |

## Executive Summary

Equilibrium was engaged by the Department of the Environment and Energy to undertake a review of current Australian standards and specifications for recycled content products including providing details on current documentation for the use of recycled materials in product manufacturing, buildings and infrastructure works.

As part of the engagement Equilibrium consulted with key stakeholders on their views as to whether the absence of any particular standards or specifications may be obstructing the take-up of recycled materials. Stakeholder interviews also canvassed broader factors influencing increased use of recycled materials.

This report contains a list of current standards and specifications as well as a compilation of the consultation results, general findings and any recommendations.

The review process uncovered a diverse range of issues and views, from high-level structural themes through to leadership capacity and very specific observations about particular material types, standards and performance.

With regard to industry perspectives, it was noted is that key parties haven't always communicated effectively, with stakeholders being very disparate and dispersed. A significant lack of national leadership and harmonisation by government was seen as a major barrier. Slow pace, intangible outcomes, soft targets, etc, were noted to not help with progressing the development and uptake of standards.

It was also felt that the lack of certainty in markets and regulatory environment have prevented or at the very least stalled investment by the waste and recycling industry in facilities that refine recovered materials into a raw material or recyclate. The lack of demand in Australia for manufactured finished product due to decline of local industry that manufacture here, minimal consumer demand for products using recycled materials and no regulated requirement were also seen as significant issues that have not assisted in further developing relevant and widely adopted standards and specifications.

A key barrier identified relates to manufacturers that have access to cheaper virgin alternatives which means they do not need to incur the cost for recyclate. While peak bodies agree on some standards and specifications, individual engineers and professionals were deemed to be typically risk averse may not always immediately embrace the value and potential of recycled content products when only price is considered to be the only consideration.

Industry has stated that there is a place for mandatory instruments to ensure higher levels of recycled content in products, buildings and infrastructure and these need to be identified and assessed on their individual merits and performance. The procurement process was also considered a priority and needs to be taken seriously by all potential stakeholders along the entire supply chain.

Some of the key issues to emerge with regard to government perspectives, include supply reliability, certainty, cost comparison to virgin materials, unknown performance for some materials, perceived OHS issues as well as organisational preferences.

The risk of potentially harmful or low-quality material being introduced into the final materials or infrastructure was also expressed. This could be due to poor established standards and controls

around appropriate processing of primary recycled material including ensuring that contamination levels are low.

Reputational or organisational risks were also considered to be a noteworthy and significant barrier to the uptake of recycled content for manufacturing, buildings or infrastructure, by the majority of the Government agencies.

The majority of the respondents thought that the Commonwealth should be responsible or play a strong leadership role for ensuring a national approach to materials instead of states taking their own approach and re-inventing the wheel. Several stakeholders believed that Standards Australia were the appropriate 'creator' of standards while also ensuring specific subject matters knowledge from relevant parts of industry, government, associations and research institutions.

In summary, the following key themes and observations have been made with respect to industry and government feedback. Further information on the findings of the consultation program is presented in Section 3 in the main body of the report.

**Table 1. Key themes and summary observations**

| **Themes** | **Summaries** | |
|---|---|---|
| | **Industry response** | **Government response** |
| Issues relating to the uptake/demand for recyclate in manufacturing, buildings or infrastructure | • The challenge is that key parties don't talk/communicate effectively<br>• Perceived lack of national leadership<br>• Cost<br>• Lack of consistent supply<br>• Quality issues<br>• OHS issues<br>• Low consumer demand for products containing recycled materials | • Supply reliability and certainty<br>• Cost comparison to virgin materials<br>• Unknown performance<br>• OHS issues<br>• Internal preferences |
| Adequacy of current standards and specifications to divert material from landfill by material type. | • Limited<br>• Lack of policing of standards by regulators and other agencies undermines the objectives<br>• Consistent supply of consistent quality recyclate is required<br>• Material needs to be fit for purpose in terns of specifications, utility, safety and cost. | • Limited although have the ability to divert some volumes in certain applications<br>• Further work needs to be done to cover more material streams |

| Themes | Summaries | |
|---|---|---|
| | **Industry response** | **Government response** |
| Wide or limited adoption | • Standards and specifications in isolation are inadequate<br>• More can be done to remove the barriers and increase the use such as strong national leadership | • Limited although could be increased through policy development and mandated use of certain materials in certain applications<br>• Standards and specifications should improve/support the use of recyclate |
| Key barriers/opportunities for existing and/or new standards and specifications in procurement processes | • Lack of innovative procurement and contractual models that encourage the use of recycled content<br>• No best practice procurement models<br>• No information sharing or pilot projects and examples that can be used to demonstrate successful outcomes | • Different recycled materials have different costs depending on level of treatment or management of the materials<br>• Risk of low service life<br>• Unknown performance<br>• OHS issues as well as organisational preferences |
| Reputational or organisational risks a barrier to the uptake of recycled content for manufacturing, buildings or infrastructure | • Waste is perceived as rubbish and an inferior product<br>• Lack of access to information, including data around product performance can potentially create technological, market and operations risk | • Seen to be a significant barrier for the majority of Government agencies interviewed |
| Other approaches or interventions and tools that could be used to increase the uptake/demand for recyclate in manufacturing, buildings or infrastructure | • Mandatory instruments can ensure high levels of recycled content in products, buildings and infrastructure<br>• Better quality recycled materials i.e. through improved collection, sorting and processing could stimulate the market | • Research, development and demonstrations activities<br>• Product specifications<br>• Product procurement'<br>• Product stewardship<br>• Policy/legislation changes<br>• Education/advocacy activities |

| Themes | Summaries | |
|---|---|---|
| | **Industry response** | **Government response** |
| Broader ussies such as behavioral or markets factor affects | • The perception of waste is negative therefore its value is underestimated<br>• Stakeholders need to work together | • The value of environmental and economical outcomes should be balanced with technical outcomes |
| Development and implementation of new standards and specifications | • Very welcomed by industry<br>• National specifications would be a highly desirable outcome. | • Should continue to be pursued<br>• R&D activities to be increased<br>• Other standards around re-use, design for disassembly, product composition standards, chemical analysis, and lifecycle analysis |
| Where does the responsibility lie, and could professional design and engineering associations/institutions assist | • Commonwealth has a key leadership role to play<br>• States to play a critical role in implementation<br>• Industry associations and Standards Australia are best placed to develop the standards<br>• Government at all levels to specify procurement of recycled content products | • Shared responsibility with lead from the Commonwealth to ensure consistency<br>• Implementation at a state level with input from environmental agencies<br>• Input from Standards Australia as well as industry associations |

# 1 Introduction

The purpose of this report is to provide a review of current Australian standards and specifications for recycled content products to the Environment Protection Branch of the Department of the Environment and Energy (the Department).

More specifically Equilibrium was engaged to:

- Provide details on current Australian standards and specifications for the use of recycled materials in product manufacturing, buildings of infrastructure works,
- Consult with key stakeholders on views as to whether the absence of any particular standards or specifications may be obstructing take up of recycled materials and broader factors influencing take up of recycled materials, and
- Compile the consultation results, general findings and any recommendations into a concise report and presentation for use by the Department.

## 1.1 Definitions

In order to compile the list of current standards and specifications, the following definitions relating to a standard and specification were used:

- **Standard -** A detailed set of specific conditions that need to be followed or met in order to attain an approved level of performance with respect to using a recycled material in product manufacturing, buildings or infrastructure.
- **Specification -** A detailed statement prescribing material types, qualities and dimensions. For example, NSW currently provides a number of specifications for the use of particular waste materials in construction of infrastructure and products.

In compiling this report, standard that were identified and included not only those that are mandatory, such as those developed and endorsed by Standards Australia or the International Standards Organisation (ISO) to ensure a minimum level of performance or use and supply, but also included other specifications, voluntary standards, industry codes of practice, guidelines, technical notes and other orders that apply to recovered materials.

# 2 Scope of work and methodology

In summary Equilibrium completed the following:

- Desktop research into current standards and specifications for the use of recycled materials in product manufacturing or civil works (including buildings and infrastructure),
- Compilation of a detailed list of stakeholders, as agreed by the Department, to be consulted on their views relating to particular standards or specifications or more broadly factors influencing the uptake of recycled materials,
- Preparation of a standards questionnaire to be used to interview stakeholders for their feedback,
- Contacting stakeholders by phone or email and inviting them to participate in the consultation program and/or respond to the survey,

- Record and analyse the findings, including a summary of the observations and recommendations relating to the project.
- Preparation of this report and a presentation.

## 2.1 Standards and specifications

A copy of the updated list of standards and specifications is provided as Appendix A.

## 2.2 Stakeholder engagement

The following stakeholders were consulted as part of the project and provided a response either through a one-on-one interview or by answering the survey questionnaire.

The project focused on consultation with relevant industries and sectors as opposed to specific professional roles and disciplines. However, a diverse range of roles and disciplines were consulted or surveyed to provide insights, opinions and general feedback. This typically included professionals and/or managers across several key disciplines including: engineering and applied technology, environment and sustainability, policy and procurement, commercial and business development.

Were possible, appropriate personnel who would have the most knowledge to respond were identified within the associations and companies and businesses consulted so that the level of feedback would enable a high level report to be prepared to address the aims of the project.

| **Government** | **Industry** |
|---|---|
| Vicroads | Ash Development Association of Australia (including Australasian (iron & steel) Slag Association, Amorphous Silica Association of Australia and Australasian Pozzolan Association) |
| Sustainability Victoria | Waste Management and Resource Recovery Association of Australia |
| ACT Capital Works Planning | Chemistry Australia |
| NSW Environment Protection Authority | Australian Tyre Recycling Association |
| Green Industries South Australia | Tyre Stewardship Australia |
| Local Government Procurement Sustainable Choice | AustStab - Pavement Recycling & Stabilisation Association |
| Victorian Department of Environment Land Water and Planning | Green Building Council of Australia |
| Western Australia Department of Environment and Conservation | Downer-EDI |
| Western Australia Waste Authority | Australian Organics Recycling Association |
| Main Roads WA | Design Institute of Australia |
| Lake Macquarie City Council | National Waste and Recycling Industry Council |

| | |
|---|---|
| | (response includes input from: Cleanaway, Alex Fraser and state affiliates WRIWA) |
| Hunter Joint Organisation | Veolia |
| **Other** | Concrete Recyclers |
| Planet Ark | Cromford Film |
| Australian Packaging Covenant Association Ltd | Martogg |
| JAS-ANZ | |

A copy of the questionnaire used in inform the project is provided as Appendix A.

# 3 Consultation findings

A summary of the findings across the responses from industry and government as well as feedback on the product categories and product use is presented as follows.

## 3.1 Industry perspectives

A major challenge that was noted is that key parties don't talk/communicate effectively, they are all very disparate and dispersed. There is a perceived lack of national leadership to enable and facilitate the process of harmonisation and consistency. In addition, Resource Recovery Orders hold great potential and should be better utilised.

The lack of certainty in markets and regulatory environment prevents investment by waste and recycling industry in facilities that refine recovered materials into a raw material e.g. resource recovery orders/exemptions can be revoked without any consultation with industry such as the Mixed Waste Organics Material order that was revoked by the NSW government in October 2018. This was seen as too risky for industry to invest and innovate.

The lack of demand in Australia for manufactured finished product due to decline of local industry that manufacture here, minimal consumer demand for products using recycled materials and no regulated requirement were seen as significant issues.

A key barrier identified relates to manufacturers that have access to cheaper virgin alternatives which means they do not need to incur the cost for recyclate. This is changing as society demand that the products they acquire re-use resources rather than use virgin materials. Some companies have already stated a % of recycled material will be used in their products, however the time frames they state will not help in the current situation. There are no known impediments to governments mandating a % of recycled material in their procurement practices. By governments mandating a certain % of recycled components in the goods they acquire, demand for the re-manufacturing of recycled products will increase.

While peak bodies agree on some standards and specifications, individual engineers and professionals are typically risk averse and don't embrace the value and potential of recycled content. A significant lack of national leadership and harmonisation by government was seen as a major barrier. Slow pace, intangible outcomes, soft targets, etc, were noted to not help the process at all.

While standards may set a specification, the frequent lack of policing of standards by regulators or other agencies undermines the objective of the standard in the first place – to help ensure outcomes that are fit for purpose in terms of specifications, utility, safety, cost and other factors.

There are multiple examples of Australian businesses working to develop standards that imported products fail to meet, but which are used because there was no checking of their claimed standard, or they were specified by parties able to flout their obligation to adhere to these standards. This not only fails the test of addressing the market failure, it materially disadvantages Australian companies that invested in the standard development process – effectively a double-hit.

Governments have the opportunity to demonstrate leadership by adopting more innovative procurement and contractual models that encourage the use of recycled content as part of a whole of life cost approach to design and building practices (for instance, through embedding the use of existing standards and specifications).

Government can also identify priority products and applications containing recycled content for consideration in government procurement, and work with other levels of government to update guidelines around best practice procurement to encourage the use of recycled content. Attention to measurable product performance and quality control was considered to be an important area in need of improvement.

The construction industry has historically preferred the use of tried and tested techniques which can act as an obstacle for the adoption of new procurement models that encourage the use of recycled materials. There is an opportunity in pilot projects to overcome potential scepticism and provide learnings which can be proliferated across the sector. This requires information sharing and collaboration by key players, such as contractors.

Industry has stated that there is a place for mandatory instruments to ensure higher levels of recycled content in products, buildings and infrastructure and these need to be identified and assessed on their individual merits and performance.

The uptake of recycled content in buildings and infrastructure is linked to the quality of the recycled materials. This can be supported through improving the collection and sorting of recycling, improving the productivity of the recycling sector and investing in recycling infrastructure to ensure market readiness of recycled products.

Early gains for increased recycling can be made by better connecting the domestic supply of stranded feedstocks to demand by: improving collection infrastructure; reducing contamination; matching separation technology with current reprocessing capability and new equipment investments and supporting the staged growth of current and new markets.

The procurement process is a priority and needs to be taken seriously by all organisations. The procurement process provides significant opportunities to address many of the barriers and issues shared by many stakeholders. The perception of waste is negative (e.g. putting rubbish in roads) and therefore its value is underestimated; it needs to be seen as a positive and as a resource. The culture and attitude of certain professions reflects a risk averse view and approach when specifying recycled content in projects and civil works.

Broader issues which can affect the uptake of recycled products include:

- The wider adoption of circular economy principles which can alter value chain around the design, construction, operation, renewal and repurposing of buildings, driving a more

sustainable business model and focusing on a more circular approach where products are recycled, upcycled and reused.

- New tools and platforms such as suitable material databases which are already in use in other sectors, can facilitate the use of recycled products.
- Government policy can ease or restrict the uptake of recycled resources and more efficient waste management practices.
- Product and processing innovation and technology improvements can improve demand for recycled products through driving up product quality.

Other issues and factors affecting the uptake of recycled content include: price, knowledge, how and where to access recycled content, and the limited state of market development activities. Improved communications and awareness raising activities to promote existing products with recycled content was also identified as an important issue. The range of key stakeholders need to pull together and work more constructively on standards, specifications and their proactive adoption

## 3.2 Government perspectives

Diverse issues including supply reliability, certainty, cost comparison to virgin materials, unknown performance for some materials, perceived OHS issues as well as organisational preferences have been identified as being important.

The risk of potentially harmful material being introduced into the final materials or infrastructure. This could be due to poor established standards and controls around appropriate cleaning of primary recycled material; the lack of market competition among suppliers; the lack of national standards/specifications; and the regulatory frameworks not being updated rapidly enough to keep up with market development activities.

Current standards and specifications are used for the procurement of the supply and use of recycled material/infrastructure. Consistency and sustainability of supply of primary source recyclable material and its impact on project deadlines and procurement. If supply cannot meet demand, then there potentially could be impacts during project delivery which should be considered during the procurement of works requiring the use of recycled material.

Procurement practices remain predominantly prescriptive. Outcome focused process will allow greater scope for innovation.

Reputational or organisational risks were considered to be a noteworthy and significant barrier to the uptake of recycled content for manufacturing, buildings or infrastructure, by the majority of the Government agencies.

Universal specifications located in the one place that are easy to follow for all material streams that are endorsed by relevant authorities would increase uptake and use of specifications and ultimately recycled content.

Locations of available recycled content could be mapped as access to recycled products that is project specific might make it easier for councils / developers to plan for using recycled content in infrastructure projects. Ensuring reliable supply of recycled content products to regional areas and high volume users such as local councils, was seen as an issue to be acknowledged and addressed.

It was identified that in the past, material purported to provide improved performance did not result in the desired outcomes. Outcome focused procurement should be explicit about the value of environmental and economical outcomes as well as technical benefits to using recyclate. Centralised processing of material for reuse can result in reduced logistical costs

## 3.3 Product categories

As it can be seen in the updated list of standards and specifications is provided as Appendix A, the majority of the documents identified relate to use of material in infrastructure projects including roads, pavements and as additives to asphalt and bitumen as well as for earthworks and as backfill.

Standards Australia has produced a number of documents relating to the re-use of plastics, polymers and there are a specifications for the use of recycled crushed glass as well as crumbed rubber for application in infrastructure projects and the recycling of wood and timber in building and construction projects that have been developed by industry associations as well as CSIRO and AustRoads etc. Most notably, the Australian Council of Recycling has developed a number of specification documents relating to PVC, LLDPE, LDPE, HDPE and other beverage container and packaging materials as well as paper although it is unknown how widely these have been adopted by industry.

It was stressed across the board that the importance of a clean source of recycled materials (i.e. no wood or organics when dealing with glass for example) needs to be communicated and adhered to.

The state-based regulators need to assist where possible with respect to potential contamination issues. Any potential environmental impacts need to be managed in the same way as conventional materials and products in order to minimise risk to the environment. It is recognised that state-based regulators have concerns regarding the life cycle of materials (e.g. if they are stockpiled / stored at sites due to fire risks and contamination etc).

Industries and developers may not be aware of where to locate recycled content, and/or the development project may be too far away from the source of materials. (i.e. transport costs outweigh the benefits).

Depending on the product, developing specifications requires ongoing testing, which could include both laboratory and infield testing. The availability of test sites may be limited, and the length of time required for testing may also potentially be uneconomical. Although, with certainty in supply these should not be seen as significant issues or barriers.

Increased demand for recycled materials would signal to the recycling industry, reprocessors and producers of recycled content that there is an end market for these materials.

Potentially harmful material introduced into the final materials/infrastructure, could result due to poor established standards and controls around appropriate cleaning of primary recycled material or the need to be cost competitive resulting in a lapse of suitable/appropriate processing was seen to be a detrimental risk in using recyclate, irrespective of the application.

## 3.4 Product use

One industry association who provided a response questioned the term recyclate as it applies to the re-use of materials that are actually a by-product or co-product as some of these have a long history of productive use.

It was unanimously agreed that the beneficial and productive use of so called 'wastes' to replace or supplement virgin resources was of great importance to the majority of the stakeholders engaged. Any substance that is wanted and can be used as a resource in its own right should be reclassified as a resource, thus removing the stigma associated with the label of a 'waste'.

Perception is considered to be an important element to the conversations. Materials labeled as wastes, it was expressed, would enviably struggle to gain market acceptance.

One state based organisation incorrectly stated that there are currently no standards applicable to building, infrastructure or manufacturing with recycled material inputs. Another stated that there are a number of standards and that they are widely adopted, but supporting policy mandating the use of recycled material use or other guidelines and incentives would accelerate the take up of options available in the standards. However, these standards and specifications will need to continue to be updated to accommodate emerging reuse opportunities.

In relation to the types of products, standards around infrastructure were identified to be the most prevalent and therefore most widely adopted when considering standards around buldings. When considering products, the most relevant standards relate to application to agricultural land as a soil enhancer and other composting activities for organic and wood products.

In relation to the use of recycled material in buildings this was seen as emerging and therefore although some standards exist, they are understood to not be widely used.

In relation to the specifications developed by Australian Council of Recyclers it was unknown as to how widely these have been adopted or used by industry.

OHS issues associated with the handling and use of materials (such as crumbed rubber in asphalt or glass in roads and pavements) can inhibit the uptake/demand for recycled content materials. Other feedback included issues with supply of recyclate (i.e. consistency, timeliness, amount) where the economics don't stack up, i.e. the use of recycled materials increases the cost of the product can also be a negative influence.

Lack of cleanliness or contamination was also seen an issue, where further processing can add to the cost of using recyclable materials.

It was recognised that safety and performance issues require significant time to assess (i.e. in the example that pavements have a design period of 40 years it is important that the product remains safe and functional). If specifications are endorsed it is recognised that there needs to be a suitable liability period/warranty period, that is competitive with other specifications relating to product manufacturing.

There is a perception that incorporation of recycled materials into pavements is putting rubbish into building materials and as such is an inferior product and a perception that recycled material may leach out of pavements and cause issues such as microplastics or pollution and contamination. It

is recognised that this is actually not the case where that materials are properly designed to be incorporated within the pavement.

Although standards are available, they are not adopted as there is no push to comply/incorporate these into final product design. It was also noted that one industry player stated that they though generally there is no perceived commercial value in establishing an alternate use for waste and whist the environmental benefits are understood, justification or the risk is the issue.

One respondent stated that standards are often a view of issues at a point in time intended to help deal with a market failure of some kind. Developing and reviewing standards is an expensive, time-consuming and cumbersome process. This is generally done by local businesses and not by importers or other stakeholders. These factors can often be barriers to updating standards that are more relevant given changes in material technology, processing technology, end-market applications and other prime considerations.

One comment that was received was the need for Government to intervene where the market is failing with respect to the use of recyclate. The hard to deal with materials should be the starting point and not the easy to deal with materials if there is to be a national approach. Collection mechanisms need to be improved particularly with respect to hard to deal with materials if they are to be considered for alternative markets and different end uses.

One respondent stated that the current standards and specifications are inadequate, over prescriptive and inflexible, and they are not mandated or encouraged as a preferable alternative.

From a local Government perspective, it was established through the communications that local Government want to be sure the product is value for money across all whole of life or lifecycle costs. The establishment of relevant assessment/testing programs need to be established so the quality of the product can be determined and is appropriate, the life of product can be established, and any safety issues identified and mitigated. There also needs to be some level of confidence that there will be a market for recyclate materials.

One participant responded that products with recycled content are not independently validated through robust support testing. Product certification is cost-intensive, and with little up-take and lack of opportunities to use these products, justification of the expense of certifying these products is difficult.

Government can provide a leadership role by requesting recycled content through policy changes or through adding recycled content producers to their procurement panels.

To promote the transition to using recyclate in new product manufacturing, the demand for this material needs to be pushed in creating a market where there are mandated specifications and embedded criteria in tender documentation. The environmental benefits of products improved with some recycled waste should be viewed as a consequence rather than a driver.

Supply considerations such as generation volumes, geographic distribution and ease of aggregations, removal of contamination and risk profiles were identified as potential issues to the uptake of recycled content materials in manufacturing and infrastructure/building programs.

The supply of primary recycled material, including the primary treatment and management of pre and post processing and consistent testing of the final construction material and infrastructure construction and the cost in dollars and time also weigh in as issues.

One industry association suggested that particular products should be banned from landfill as the starting point to making it economical to re-use the materials in recycled content products. There needs to market certainty that these products will have an economic value. The introduction of an end of waste process, similar to that that has been introduced into Queensland could be a good approach if adopted nationally.

### 3.5 Other considerations

Waste and Resource Recovery Hubs and land use planning could facilitate the siting of recovery and re-use facilities. Foe example concrete crushing could be paired with concrete batching plants and bitumen plants, to further assist with the uptake of recycled materials. Another example would be tyre shredding facilities, with bitumen and footpath manufacturing sites. Zoning and relevant overlays of sites with appropriate buffers sites could attract industrial ecologies and industry that can work in synergy to increase the use of recycled content in building and infrastructure projects.

## 4 General observations and recommendations on roles and responsibilities

It was identified throughout the consultation that the majority of the respondents thought that the Commonwealth should be responsible or play a strong leadership role for ensuring a standard, national approach to materials instead of states taking their own approach and re-inventing the wheel (e.g. NSW is currently reviewing their entire waste strategy and circular economy commitment).

Lessons learned from each state should be shared and a national approach, with support from national bodies, should assist to facilitate action, with local states adopting the approach to their own region. It was also identified that industry should also form part of the development team or at least have input into the process to ensure robust technical and commercial input.

It was identified that there should be more work done at a collective national/international level to help:

- co-ordinate and improve knowledge around source collection management and treatment of primary recycled material.
- ensure outcome-focused procurement is explicit about the value of environmental and economical outcomes as well as technical

There are a number of activities which could be done on different levels. Some of these could be managed at a national level much like how AustRoads approaches standardised testing procedures for new innovative materials/systems. AustRoads already has a project which is focusing on developing harmonised technical specifications for road related infrastructure, which could potentially provide guidance on the use of recycled material.

The actual process of developing the standards and specifications could be undertaken on a state level while being coordinated at a national level. Several stakeholders believed that Standards Australia were the appropriate ‘creator’ of standards while also ensuring specific subject matters knowledge from relevant parts of industry, government, associations and research institutions.

The Commonwealth Government has a key leadership role to play, but also acknowledging that States play a critical role in implementation.

Some States are relatively advanced in their measures, policies and procurements on increasing recycled content and this needs to be recognised and supported, not impeded.

This is where national standards and specifications are vital and the Commonwealth Government must step up to doing more, doing it well and doing it in a timely manner said one respondent. The implementation of the new standards and specifications, particularly with respect to infrastructure projects, would logically be the responsibility of the local jurisdictions.

Research and Development (R&D) tax concessions for the development of standards and specifications and grants and funding programs to change product over to recycled content could also benefit the industry.

Industry Associations and Standards Australia are best to develop or create the standards. Government at all levels could assist with specifying their purchase. There is sometimes a cost penalty to be paid for recycled materials and lowest cost tendering is therefore imperiled and cost to taxpayers sometimes consequently higher.

## Appendix A: Updated list of standards and specifications

See accompanying MS Excel file.

## Appendix B: Survey questionnaire

Equilibrium has been engaged to assist the Department by:

- Updating details on current Australian standards and specifications for the use of recycled materials in product manufacturing, buildings or infrastructure.
- Consulting with key stakeholders on views as to whether the absence of any particular standards or specifications may be obstructing take up of recycled materials in product manufacturing, buildings or infrastructure
- Consulting with key stakeholders on the broader factors influencing take up of recycled materials
- Compiling the consultation results, general findings and any recommendations in a short report and presentation

As such we are interested in your ideas and attitudes for the purpose of presenting the key issues and opportunities related to standards, specifications, guidelines and increasing the demand for recyclate for use in product manufacturing, buildings or infrastructure.

**The intent of the project is not to review all standards, specifications and guidelines (herein 'standards and specifications') associated with waste and recycling – only process and technologies for using recyclate back into product manufacturing, buildings or infrastructure.**

| | |
|---|---|
| 1. Name/title | |
| 2. Company/organisation | |
| 3. What standards and specifications are you aware of that relate to using recycled content materials | |
| 4. Currently what issues do you believe exist for the uptake/demand for recycled content materials in product manufacturing, buildings or infrastructure.<br>(consider all of the potential fates for recyclates) | |
| 5. Are there any reason these standards aren't widely adopted | |
| 6. Are these standards and specifications adequate to enable the diversion and recycling of the volumes of waste that is currently going to landfill in large volumes (i.e. masonry materials, ash (fly and bottom), organics and hazardous materials (particularly contaminated soil)) | |

| | |
|---|---|
| 7. Other materials such as glass and plastics are problematic with respect to stockpiling / disposal to landfill.<br>If there was further work to be done what should be the focus in relation to the development of standards and specifications for these materials. | |
| 8. What are the key barriers/opportunities for existing and/or new standards and specifications as they relate to using recyclate in new product manufacturing, buildings or infrastructure. | |
| 9. What are the barriers/opportunities in government procurement processes that relate to the uptake and specification of recycled content in new product manufacturing, buildings or infrastructure? | |
| 10. What are the barriers/opportunities in private sector procurement processes that relate to the uptake and specification of recycled content in new product manufacturing, buildings or infrastructure? | |
| 11. To what extent is organisational risk management a barrier/opportunity to the uptake and specification of recycled content in new product manufacturing, buildings or infrastructure? | |
| 12. What other approaches, interventions and tools could be used to encourage the uptake and specification of recycled content in new product manufacturing, buildings or infrastructure? | |
| 13. Are there any other broader issues (i.e. behavioral, market factors) affecting the uptake of recycled materials in manufacturing new products, buildings or infrastructure. | |

| | |
|---|---|
| 14. Do you think there are any other new standards and specifications that you should be developed and implemented? | |
| 15. Who do you think should take responsibility for developing, implementing new standards/specifications.<br>• Commonwealth<br>• States<br>• Standards Australia<br>• Professional institutions/associations<br>• Other? | |
| 16. How could professional design and engineering associations/institutions (eg. Engineers Australia, Design Institute of Australia) be involved to encourage the uptake and specification of recycled content in new product manufacturing, buildings or infrastructure? | |
| 17. Any other feedback not covered above. | |