Catalyst to achieving a circular economy

Response to the

Banning exports of waste plastic, paper, glass and tyres

Discussion paper on implementing the August 2019 decision of the Council of Australian Governments

3 December 2019

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Introduction

Thank you for the opportunity to provide comment on the *Banning exports of waste plastic, paper, glass and tyres discussion paper on implementing the August 2019 decision of the Council of Australian Governments.* The AIEN both congratulates and encourages the Australian Government's efforts to address the issue of waste exports and build Australia's capacity to manage and generate demand for these commodities, however believes that the collective response must be collaborative, comprehensive and coordinated if Australia is to emerge from its current predicament.

Below we have provided a summary of our feedback in response to the Discussion Paper. We would be pleased to provide additional information or clarification of any points if required.

Attachments:

- *Accelerating the Transition to a Circular Economy: A blueprint for action on plastics and packaging*
- Letter to Hon. Matt Kean MP, NSW Minister for Energy and Environment – 23 Sep 2019: *20-year Waste and Resource Recovery Strategy*

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1. Tell us about your organisation:

What does your organisation do? Which sector/material stream(s) are you involved in?

The Australian Industrial Ecology Network (AIEN) is a vibrant network of like-minded individuals, companies and institutions with a common interest in sustainable development through the study and practice of industrial ecology. We advocate the principles and concepts of industrial ecology in policy formation and business practice. The AIEN actively engages with organisations to facilitate improved performance and environmental benefits.

AIEN's Charter is to:

1. **Advocate** the principles and concepts of industrial ecology in policy formation and business practice.
2. **Provide services** to industry and all levels of government, which facilitate the transition from linear to circular economies.
3. **Maintain a forum** for networking in which individuals and organisations can engage with one another to share information and experience in order to encourage and develop the use of Industrial Ecology.
4. **Collaborate with educational institutions** to promote awareness of industrial ecology and help develop teaching resources.
5. **Be a 'go-to/can-do' organisation**, that facilitates and promotes Industrial Ecology

Put simply, in line with its charter, the AIEN does whatever it can to further the cause of industrial ecology. In effect, the AIEN aspires to become the 'go-to' organisation for all things related to industrial ecology, including collaboration on the design, planning and implementation of IE projects.

Which part(s) of the supply chain are you involved in (e.g. producer, processor, supplier, transport, exporter or local government)?

The AIEN's membership represent all facets/elements within industry supply chains.

Where is your organisation based and across which states/territories does it operate? What is the size of your operation? For peak organisations, please provide details about the members you represent. For businesses, please provide details about your approximate capacity (e.g. 25,000 tonnes each year).

AIEN members include:

- Individuals and organisations in sectors such as manufacturing, minerals extraction, agribusiness, forestry, retail and resource recovery. Industrial ecology is even relevant to the tourism industry, in its various forms.
- Individuals and organisations in professions such as industrial design, urban and environmental planning, accounting, finance, law and corporate advisory work in strategic development.
- Federal, State and Local Government agencies and individual employees.
- Individuals and organisations associated with tertiary, vocational and corporate education, such as, academics, teachers and especially students.

2. Impact on your business/organisation:

a. What will the COAG export ban mean for your organisation/members and day-to-day business operations?

The AIEN is aware of the increased difficulty anticipated by many companies in disposing of those waste stream components to be banned. Based upon the additional materials required to be managed domestically as a consequence of the bans, members have conveyed they anticipate:

- Increased disposal charges;
- Commensurate increased separation/segregation requirements to facilitate disposal; and
- Increased inventories of waste materials to be managed at their facilities.

b. If it results in a change to your business, what does that change look like?

The employers of all individual AIEN members and corporate AIEN members will likely experience increased waste management charges due to the loss of the export markets. These markets had previously been partly off-set waste management charges given export costs were less than domestic landfill costs.

c. Will these changes require your business to invest? If so, what is the approximate dollar value of the investment? What would be the main focus of this investment (for example, new infrastructure or hiring new staff)? What is this investment expected to result in (for example, increased capacity from X to Y, new products being developed)?

The investment will be in increased waste management charges where domestic markets are unavailable. There are a number of member organisations who will invest directly but no survey of member's employers has been undertaken by the AIEN.

d. Are there any impediments to investment and how can these be overcome?

Investment requires the establishment of alternate domestic markets for the materials previously exported. The AIEN has long advocated development of these domestic markets as a national priority. The development of domestic markets has unfortunately been forced upon us with little time to adequately react.

e. Could these changes create jobs in your business? If so, approximately how many?

Long term jobs may result. However, there are not available markets for much of the material at present and economic pain is inevitable in undertaking the requisite transitions.

f. What are the other challenges and/or opportunities for your business/industry as a result of the export ban?

The challenges/opportunities revolve around development of domestic product markets for goods produced from recycled materials, new technologies and infrastructure for the domestic processing of recycled materials. Many of these opportunities must be seized for our resource management future to be tolerable. However, the transition to the tolerable resource management future will inevitably be a painful one.

3. The proposed definitions and timetable for implementing the COAG export ban are at Figure 2

a. Are there any additional waste plastic, paper, glass or tyre materials that should be included in the proposed timetable? Please detail why and in what circumstances.

The AIEN expects the bans will be focussed upon those materials where other countries seek import prohibition. Ultimately, the AIEN would seek domestic management, reuse, recycling of all domestic material streams and ultimately, banning the export of all waste is desirable. However, as a consequence of the collective lack of vision in resource management to this juncture, industry and service providers have sufficient to deal with between now and 2022. No additional pain is required for the moment.

b. Are there any waste plastic, paper, glass or tyre materials you consider should be excluded from the ban? Please detail why and in what circumstances.

No. Certainly not in the longer term.

c. How ready is your business/industry/local government to meet the proposed start dates for banning the exports of different types of waste plastic, paper, glass and tyres?

It is the AIEN view, the entire economy is ill prepared. Domestic reuse and recycling industries are either largely ad-hoc or immature at best. There are inadequate domestic product markets, inadequate manufacturing infrastructure to cope with the volumes of materials generated as waste. The level of Australia's inadequacy/deficit is about to be further increased.

4. Industry and government actions:

a. What could industry do to help your business or sector to ensure the waste export bans are effective and adverse consequences are avoided? (Please be as specific as possible.)

The preparations should have begun long ago. Australia needs demand driven and mature end product markets for recycled content goods. There is massively more resource material (waste) available than there is market for the recycled materials as raw materials. It is a very unfortunate truth that Australia will need to work enormously hard to overcome the domestic market and infrastructure deficits over time. Even with enormous effort, the legacy of the current situation will likely take decades to fully address.

b. What could government do to help your business or sector to ensure the waste export bans are effective and adverse consequences are avoided? (Please be as specific as possible.)

Commence dialogue with the AIEN in relation to planning a considered response and the development of pathways toward implementing a circular economy. The magnitude of the current resource management crisis in Australia cannot be underestimated. This is a crisis that Government and industry should have foreseen. The national fixation with short term returns and short-term vision has not served us at all well in the resource management arena.

c. What actions can industry and governments (Commonwealth, state, territory and local) take to drive demand for the use of recycled materials?

The AIEN firmly believes the current challenges/opportunities can be faced and managed in time. However, the collective response must be collaborative, comprehensive and coordinated if Australia is to emerge from its current predicament. The AIEN has a vision and plan to address the long-term

5. What do you consider is the largest barrier to improving waste management and recycling in Australia?

- Lack of vision
- Lack of investment
- Lack of leadership
- Lack of urgency

6. Please provide any further information relevant to implementing the export bans.

Nil

ACCELERATING THE TRANSITION TO A CIRCULAR ECONOMY:

A BLUEPRINT FOR ACTION ON PLASTICS AND PACKAGING

October 2018

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Disclaimer

Contents

What is the AIEN?

The Australian Industrial Ecology Network (AIEN) is a vibrant network of like-minded individuals, companies and institutions with a common interest in sustainable development through the study and practice of industrial ecology. We advocate the principles and concepts of industrial ecology in policy formation and business practice. The AIEN actively engages with organisations to facilitate improved performance and environmental benefits.

The AIEN is also a forum in which people can discuss ideas, seek advice from one another, connect with resources associated with the practice and study of industrial ecology or simply keep in touch through the network with developments and best practice in their areas of interest.

The AIEN was established as a proprietary limited company in October 2014 to promote and facilitate industrial sustainability through the application of industrial ecology. The company aims to provide a 'window on the world' of industrial ecology by relaying news, canvasing new ideas, producing position papers on topics such as energy from waste, organising events and alerting people to developments in academia and in practice. In effect, AIEN aspires to become the 'go-to' organisation for all things to do with industrial ecology, including collaboration on the design, planning and implementation of IE projects.

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Introduction

The AIEN is committed to the establishment of a full circular economy for the resources currently categorised as 'waste'.

The AIEN has a diverse membership numbering in excess of 200 individuals and businesses. Among its membership there are many fine resource recovery examples/case studies demonstrating the circular economy and its principles. The membership, however, remains fully aware that the current examples are merely case studies and that much effort will be required to achieve the revolution in materials management requisite to usher in circular economy as the resource management norm.

To this end, the AIEN has prepared this blueprint for prioritised action with respect to facilitating circular economy and start the circular economy 'flywheel' spinning.

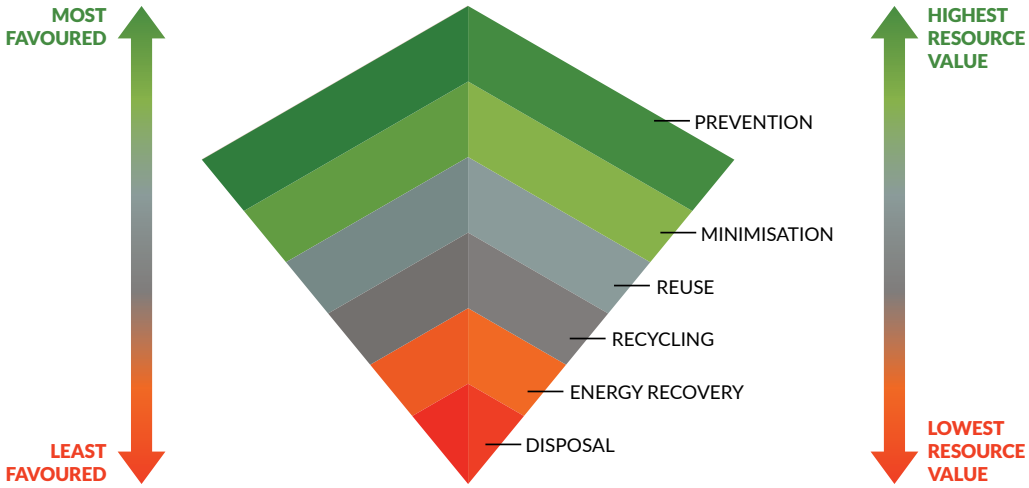
Preamble - Circular Economy

The AIEN believes there are opportunities available for the recycling/reuse of mixed plastics, rubber, glass, timber, aggregates, as valuable resources in higher value add product markets. Further, the AIEN endorses the concept of Highest Net Resource Value (HNRV) as worthy of detailed consideration and promotion. It is a concept enshrined within the waste hierarchy, but with a more tangible and measurable output.

HNRV reflects an approach that seeks to achieve or retain the highest possible resource value from the materials under consideration, 'net' of the cost and effort to achieve such an outcome.

The waste hierarchy is normally presented only in the context of environmental/social good. The AIEN has re-imagined the waste hierarchy as representing the notional value applied to a given 'resource'.

At the low-end, disposal to landfill implies the generator places a negative value on the resource. At the high end, the generator places full commercial value upon the resource through avoidance and/or minimisation.



Any failure to properly consider the importance of the waste hierarchy and HNRV principles may result in losses in the longer term through stranded investment. When resource availability becomes a constraint, resources will always flow to those who can afford to pay the most for them. This is why over-investment in energy technologies is not recommended.

In certain circumstances, including remote geographic location, and small and highly diffuse resource quantities, there may be valid arguments that energy recovery represents the HNRV achievable for resources otherwise considered as wastes. However, it would be lazy in the extreme to settle for lower resource values simply for ease and expedience. Energy from waste should only be considered where:

- HNRV alternatives have been fully saturated with the resources they require. This means energy recovery activities are restricted to 'residual' resources not required by the higher value adding processes; or
- Where very unusual circumstances are such that energy recovery is the only feasible process for the recovery of economic value from resources that would otherwise be wasted in landfill.

Blueprint for action

Existing policies and resource management frameworks have primarily focussed on raising awareness and placing obligations on manufacturers, importers, distributors and other persons in the following important areas:

- Separation and segregation of materials/components so as to avoid contamination;
- Aggregation of post-consumer materials/components; and
- Initial treatment of the post-consumer materials/components (in some cases).

The other important pre-requisites for a circular economy, however, include:

- Design of plastics and packaging to reduce waste and enable recycling at end of life;
- Processes and infrastructure to enable materials or components to be reused and/or recycled; and
- Establishment and support for consumer markets for the reused and/or recycled materials/components.

The AIEN believes a holistic Australian approach must incorporate these additional elements in order to successfully move toward a circular economy. The proposed actions and targets outlined in the Discussion Paper: *Updating the 2009 National Waste Policy*[1] are a commendable start, but they need to go much further.

Following the waste hierarchy, the National Waste Policy (NWP) discussion paper proposes a national target of an 80 per cent average recovery rate from all resource recovery streams by 2030.

AIEN's recommendations are outlined on the following pages, with a focus on four key areas: design, collection and segregation, reprocessing and end markets.

[1] http://www.environment.gov.au/protection/national-waste-policy/consultation-on-updating-national-waste-policy

KEY AREA 1:

Product and packaging design

The design stage provides the greatest opportunity to reduce waste at source and to ensure that products and packaging are designed for a circular materials flow.

Progress being achieved

The NWP discussion paper proposes a national target to reduce the total waste generated per capita by 10 per cent by 2030. This is supported by a target to phase out problematic and unnecessary plastics by that same time.

The Australian Packaging Covenant Organisation (APCO) is working with its 1,100 members to improve packaging design through:

- Mandatory use of the Sustainable Packaging Guidelines (SPG) for all new and updated packaging;
- Development of the PREP design tool to assist manufacturers to design for recycling[1]; and
- Members being required to report annually on their progress in reducing and recycling packaging.

Areas for improvement

The AIEN believes more urgent action is required and the proposed waste reduction target is too modest, with the time frame suggested being too great. If the current waste and resource recovery issues are to be satisfactorily addressed, strong government signals are essential in the following areas:

- Stringent packaging design criteria that minimise use of packaging materials;
- Product design criteria that create an environment where repair and reuse become the predominant end of life options; and
- Education programs for manufacturers and consumers to ensure behaviours are strongly aligned with waste minimisation/avoidance initiatives.

In the absence of clear evidence suggesting economic harm and/or major disruption associated with compliance issues, the AIEN would advocate for more stringent targets than suggested. A 10 per cent reduction in per capita waste by 2030 is considered insufficient. Waste minimisation initiatives related to product design may take time to work through the economy. Mandated initiatives related to minimisation of packaging quantities, types, and there similar can, however, be implemented in much shorter time frames.

Presently, there are problematic plastics being used that cannot be reliably removed from plastic waste streams using current infrastructure. The presence of these contaminating plastic items consistently results in the diversion to landfill of large quantities of otherwise recyclable material. Examples of these contaminants include PVC (present in a small proportion of beverage containers) and coloured PET. Even in small quantities, these contaminants destroy the value and markets for large volumes of otherwise recyclable plastics.

In line with international trends and actions (for example, Japan, South Korea, France and California), the AIEN calls upon the Australian jurisdictions to move rapidly toward banning PVC, coloured PET in drink containers and other plastic materials that adversely impact on current domestic recycling systems.

Consumers (households) also have a role in reducing their consumption of plastic shopping bags, straws and non-recyclable packaging. Governments could encourage this through a carefully targeted education program, supported by local councils and brand owners.

Finally, packaging suppliers and brand owners are disconnected from collection, segregation and reprocessing systems for their products at end of life. The new PREP design tool is helping companies to design for recovery, but more direct communication between packaging developers and recyclers would also assist.

[1] https://prep.org.au/main/content/home

RECOMMENDED ACTIONS

1. The Australian Government and State and Territory Governments establish a more ambitious waste reduction target higher than 10 per cent by 2030
2. The Australian Government works with other jurisdictions, APCO and other industry stakeholders, to clearly identify 'problematic and unnecessary' plastics packaging for a potential ban under the Product Stewardship Act. At a minimum these should include:
    a. Single use plastic shopping bags;
    b. PVC bottles and containers;
    c. Coloured PET bottles and containers;
    d. Polystyrene packaging; and
    e. Plastic straws.
3. In recognition that government bans take some time to implement, APCO strengthen the Sustainable Packaging Guidelines to include a voluntary ban on problematic and unnecessary plastics including those mentioned above.
4. The Australian Government works with other jurisdictions, APCO and other industry stakeholders to develop an education program for households to encourage them to reduce their consumption of packaging.
5. AIEN works with APCO and key industry associations including Australian Council of Recycling (ACOR), National Waste and Recycling Industry Council (NWRIC) and Waste Management Association of Australia (WMAA) to develop closer links and communication channels between packaging developers and recyclers.

KEY AREA 2:
Collection and segregation

Progress being achieved

Household packaging is collected for recycling through two primary systems:

- Drop-off points for packaging covered by container refund systems (all jurisdictions except Victoria and Tasmania already have or plan to introduce a scheme); and
- Co-mingled collections: mixed recyclables (rigid plastics, cardboard packaging, paper, aluminium cans, steel cans) are placed in the yellow-top lid for kerbside collection.

This provides a convenient system for consumers.

Co-mingled collections are sent to a Materials Recovery Facility (MRF) where they are sorted into different material streams depending on available end markets.

Other systems include:

- Drop-off services funded by brand owners and other stakeholders, for example, REDcycle for soft plastics, Paintback for paint containers;
- Commercial services that collect packaging from retailers, manufacturers and other sources.

Areas for improvement

The main challenge at present is the level of segregation at MRFs. Import restrictions imposed by China, followed by several other Asian countries, have limited export markets, particularly for mixed paper and mixed plastics grades, and reduced prices (in some cases converting a positive value to a negative one).

MRFs are currently paid a gate fee to sort recyclables and send the segregated, baled materials to re-processors. Once fixed in a contract, the gate fee does not provide an incentive for the operator to invest in equipment or labour to positively sort any more materials for recycling, without a market value that can cover the additional cost.

A contributing factor to poor segregation and high costs at MRFs is the high level of contamination received by many operators. This includes non-targeted packaging like soft plastics, as well as general waste such as textiles.

Consumers need more education to help them 'recycle right'.

RECOMMENDED ACTIONS

1. Local councils change MRF contracts to incentivise increased segregation of materials to increase the market value of collected packaging, for example, through more investment or slower throughput.
2. MRF operators, with the support of state government funding programs, invest in technologies to improve segregation and the quality of sorted materials.
3. The Australian Government works with other jurisdictions, APCO and other industry stakeholders to develop an education program for households to help them 'recycle right'. That is, source-separate correctly at home.

KEY AREA 3:
Reprocessing

Progress being achieved

There are many companies in Australia that reprocess packaging into intermediate products like plastic pellets, or finished products like paper, plastic kerbing and furniture. AIEN members demonstrate many resource recovery examples/case studies espousing the circular economy and its principles.

Areas for improvement

The AIEN is fully supportive of a national target to achieve a mean recovery rate of 80 per cent from all resource recovery streams, following the waste hierarchy, by 2030. The AIEN would add the following points to consider in relation to the proposed target:

- The 80 per cent average recovery rate must be a real measure of (otherwise) waste resources being utilised back in the productive economy. The diversion must be verifiable, and the utilisation of the resources at the various levels in the hierarchy must be reported. This will allow follow-up targets in aiming for higher value resource utilisation into the future. It would not be acceptable to the AIEN if the compliant recovery rate was based around high levels of energy recovery without further vision to move to higher levels in the waste hierarchy.
- In seeking to achieve the 80 per cent recovery target, governments must be cognisant that genuine and fundamental change is required, involving new entrants to the recycling/ resource reuse markets, new technologies and new marketing/commercial strategies. Simply funding or supporting new infrastructure for large industry incumbents will only result in improved transport, separation and segregation of the resource streams. The circular economy will only be realised when new processing technologies, new products and new markets are developed. Existing industry incumbents have a clear role but they are generally not best placed to develop new processing technologies, new products and new markets.
- The circular economy can only work once the resource management sector transitions from a supply push market (with rewards driven by gate fees), to a demand driven market with supply chain participants rewarded in accordance with the value they add. The circular economy is predicated on interrelated markets fully functioning as markets. The concept of a gate fee in resource recovery markets is ultimately as distorting to free trade/ markets as government subsidies or tariffs in other commodity markets. If the circular economy is ever to become a reality, the policy must accommodate this transition.

In summary, the AIEN believes any action in achieving 80 per cent resource recovery rates (or greater) must be predicated on the development of a genuine domestically based circular economy. It must not be based on, among others, interjurisdictional transport arrangements, interjurisdictional waste levy distortions, international disposal masquerading as commodity trading, long-term reliance on energy from waste strategies.

The prerequisites include:

- Introduction of new entrants into the recycling/ resource reuse markets, new technologies and new marketing/commercial strategies; and
- Transition to demand pull commodity markets for the reuse of preloved goods, recycled content within new goods and goods made exclusively from recycled content.

RECOMMENDED ACTIONS

1. State and Territory Governments provide financial support for R&D, investments in new equipment, and market development activities, particularly those that will increase recycling of plastics or glass.
2. State and Territory Governments reduce approval times for new or expanded recycling facilities.

KEY AREA 4:

End markets and procurement

Progress being achieved

Many organisations are purchasing products made from recycled materials, including recycled packaging. For example, many councils are working with manufacturers to trial innovative products such as asphalt made with soft plastics and glass.

Some multinational brand owners have targets for minimum levels of recycled content in plastics packaging. Additionally, large organisations are starting to work with recyclers to identify products that can be made from their own waste and then purchased by the organisation.

Further to the 2030 proposed target in the NWP discussion paper, an industry-led target was also announced, with 30 per cent average recycled content across all packaging[1].

Other proposed actions and targets in the NWP discussion paper include:

- All Australian governments to adopt sustainable procurement policies or guidance with measurable targets for use of recycled content by 2020;
- 30 per cent average recycled content in goods and products purchased by governments, by total volume, by 2025;
- National standards and specifications for high priority recycled materials or applications in place by 2020;
- Standardised national product labelling indicating the percentage of recycled content in packaging by 2020;
- Australian businesses adopt sustainable procurement policies or guidance with measurable targets for use of recycled content by 2025; and
- 30 per cent average recycled content in goods and products purchased by businesses, by total volume, by 2030.

Areas for improvement

The AIEN questions whether an 80 per cent average resource recovery rate is consistent with a 30 per cent average recycled/reused/repurposed content across all goods and infrastructure procurement. If a genuine domestic circular economy is to be realised, there must be a degree of correlation between average resource recovery and average recycled/reused/repurposed content in procured goods and infrastructure across the economy. Without these resource recovery and resource utilisation targets being consistent, excess/surplus materials will inevitably arise, market distortions will result and unwanted consequences will almost inevitably occur. It is anticipated more ambitious resource utilisation targets are required to achieve this consistency. Detailed analysis of material flows (waste generated and products purchased) should be undertaken at a sectoral level to determine the most appropriate overall target as well as targets for individual product categories.

More work needs to be done by all stakeholders to increase demand for products made with recycled materials. The actions and targets in the NWP discussion paper, if approved, need to be closely monitored and enforced to ensure that they are met. All large organisations in the public and private sector need to look for opportunities to buy products with recycled materials. A model that is starting to work well is for organisations to work closely with recyclers on 'closed loop collaborations' that enable them to buy products containing their own waste streams.

Household consumers can also support end markets by purchasing products with recycled content. A national labelling scheme for packaging, as proposed in the NWP discussion paper, will assist but it needs to be mandatory.

1 http://www.environment.gov.au/minister/price/media-releases/mr20180926.html

RECOMMENDED ACTIONS

1. The Australian Government and State and Territory Governments establish a more ambitious recycled content target than 30 per cent by 2030.
2. The Australian Government introduces a mandatory labelling scheme for recycled content in packaging.
3. The Australian Government closely monitors and reports progress towards the targets in the NWP.
4. Organisations in the packaging value chain, including packaging suppliers, brand owners and retailers, work with recyclers to identify and purchase recycled products that meet their procurement needs.
5. State and Territory Government organisations and local councils work with recyclers to target recycled materials in procurement, particularly for civil construction.

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23 September 2019

The Hon. Matt Kean MP
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Dear Minister Kean,

The AIEN congratulates the NSW Government on seeking to comprehensively address resource management across the State for a period of 20 years through development of the *20-year Waste and Resource Recovery Strategy* (20YWS). This is clearly both a necessary, and ambitious undertaking, and the AIEN remains at the service of the NSW Government in the development, implementation, assessment and review phases of the coming strategy. Please accept the thanks of the AIEN for the opportunity to contribute at the early development stage of the 20YWS

The current waste/resource recovery system has its origins in assuring basic public health protection requirements, and the associated legislative requirements, were met. This established service provision has an embedded emphasis on payment for service (collection and disposal). Conversely, within a fully functioning circular economy (CE), the same post-consumer material flows need to be received and processed within a specialist, dedicated and fully quality controlled/assured "recyclate" materials manufacturing sector. That materials manufacturing sector making the recyclable materials available to its own customers and end user markets.

In forwarding this initial contribution, several important focus areas will be highlighted. The AIEN considers each of the following focus areas to be vital prerequisites/ingredients if a circular economy is to be successfully introduced in NSW. The key focus areas include:

1. Identification/acknowledgement of the largely absent ingredients for a circular economy;
2. Prerequisites in transitioning from "supply push" to "market pull" in resource recovery markets;
3. Identification/acknowledgement of market failure and the necessity for Government leadership;
4. Ensuring Government policy promotes/encourages action from all societal groups required to implement a circular economy;
5. Means by which Government can be highly influential in stimulating resource/material recovery markets;
6. The importance of ensuring resources are directed to their highest net resource value (HNRV), to remain in the productive economy for the longest possible time; and
7. The importance of working toward a cross-jurisdictional/national approach.

A Circular Economy – The Currently Largely Absent Ingredients

The AIEN strongly encourages the NSW Government to establish and foster a circular economy. Several important fundamental pre-requisite conditions (currently absent) must be established. These include:

1. Full commitment to the establishment of potential product markets through appropriate procurement and market development policies. The NSW Government is a signatory to the updated National Waste Policy (2018) which includes a target for 30% recycling (into products!!!) of all recovered resources by 2030. This includes 30% recovered content in NSW Government purchases and all private purchases within NSW by 2030. Given on average, each resident of NSW disposes of approximately 100kg of plastic per annum, a fully circular economy will correspondingly require each resident on average to consume products that include 100kg of recycled plastics. The simple truth is these product markets do not exist either in NSW or in Australia. There are isolated pockets of activity but essentially, the markets for recycled content largely do not exist. It is the AIEN's contention these markets will not be created through the guiding hand of the free market alone.

2. Ensuring the vast majority of Government support monies are used to support schemes and systems that will deliver a circular economy for NSW. Traditionally the bulk of Government financing has been utilised for marginal enhancements to separation and segregation technologies with overseas "commodity" trading in mind, new and grandiose material collection schemes without thought as to how the collected materials will be reprocessed, etc. Some of these schemes will be important and should rightly be funded. However, the AIEN counsels the NSW Government to do so **ONLY** where that scheme or separation/segregation enhancement supports genuine domestic recycling and product manufacture.

3. Ensuring there is appropriate attention/resourcing afforded to improved future product design to ensure waste is eliminated, products are designed for repair and rebirthing, products are designed for easy dismantling and recycling, etc. This condition will necessitate a complete society wide rethink in terms of the acceptance of inherent redundancy. The necessary educational messages regarding design and repair of goods are currently largely absent. The AIEN anticipates moving away from the convenience of a "throw-away society" will require significant commitment over an extended time.

4. Ensuring the Australian developed emergent disruptive technologies (for each individual component of the waste stream) are fostered and encouraged. The AIEN can assure the NSW Government that many of the innovative technologies it seeks, in order to implement a circular economy, already exist within Australia and in many instances, NSW itself. All jurisdictions in Australia have proven themselves (to this point) to be spectacularly unsuccessful at identifying and backing world leading Australian technologies in the resource management and resource recovery space. The AIEN would be pleased to provide introduction to the NSW Government to a significant number of such technologies through its network. Despite the best efforts of the NSW Government thus far through its *Waste Less - Recycle More* program over the past six years, the unfortunate truth is that support/backing for world leading Australian technologies in the resource management and resource recovery space remains essentially absent in many important endeavours.

In making this contribution to the establishment of a circular economy in NSW and Australia generally, AIEN is guided by some basic goals and definitions to describe the fundamentals of a functioning circular economy:

1. To design "waste" out of the system;
2. The system being the gross flow of resources, materials and energy through the economy to support the provision of services enjoyed by the community as a whole; and
3. "Waste" can be generated by avoidable or even unavoidable processes along any particular production/value chain, but in a circular economy next best or highest net resource value (HNRV)[1] recovery options would be systematically available, efficient and adopted.

From "Supply Push" to "Market Pull" In Resource Recovery Markets

Before summarising some of the key functions and drivers for the logical operation of a circular economy, it is perhaps useful to consider the global scrap metal sector as a closely related industrial sector. In summary, this sector functions as smoothly as it does due in large part to the following elements:

1. The fully quality controlled/assured sector is driven by "market pull". The sector provides scrap/secondary resources to its informed customers based on the clearly definable benefits, not as cost effectively available from primary sources.
2. Well defined product specification exists to support and enable "sight unseen" global trading and as marketed via well-established exchanges (LME, CBoT, etc.).
3. Such "recyclate" materials are made and delivered to the defined specifications referred to in the customers' orders and delivered fit for the identified purpose.

AIEN is of the view that whilst the scrap metal sector is not perfect, the fact that such a system can work so effectively for one particular sector provides some comfort and guidance for the achievement of related "market pull" systems and outcomes for all the main material categories in urban waste streams, including:-

- All the types and colours of product and packaging applied plastics;
- All types and colours of glass;
- All forms of residual biomass;
- All forms of paper and cardboard;
- All the products and materials requiring and/or benefiting from direct management as product stewardship defined materials; and
- Miscellaneous synthetic materials.

[1] The concept of Highest Net Resource Value (HNRV) is discussed in additional detail commencing on Page 8.

As previously mentioned, genesis of our “waste management” system is derived to address public health protection obligations. Although the assurances regarding public health cannot be diminished, it is possible that nothing short of complete root and branch restructure will be required to transition toward a society-wide resource management revolution (i.e. a circular economy). For the sake of simplicity and expedience alone, we should resist endeavours to inappropriately “shoehorn” the revolutionary resource management requirements into structures/systems designed primarily to promote the interests of public health. It will remain to be seen the extent to which the existing structures/systems can be retained and advantageously applied.

It must be accepted and understood the basis for the establishment of a circular economy is simple application of supply and demand principles. In assessing the “waste” model largely in operation within Australia to this point, it must be accepted the model (driven by “supply push”) exists simply because there is more “waste” supply, than there is demand for those materials as a resource. The consequence of resource oversupply (be it components of the waste stream or anything else) is a fall in value. In fact, in its extreme, oversupply could mean the resource in question has a negative value with owners required to pay to relieve themselves of the excess resource. This description characterises the model we have collectively built around “waste”. The only way out of the above described nexus is to implement policies to establish (or re-establish) value in relation to the resource in question.

The transition to a circular economy must successfully navigate the society from the existing "waste" sector, driven by gate fees to a quality assured "recyclate" manufacturing sector, making virgin replacement raw materials that the brands can absolutely rely on for quality and reliability of supply. All of this must additionally be based upon recycled material values remaining competitive relative to virgin raw material equivalents. This transition will require careful management to ensure the endeavours of all participants are fully co-ordinated. NSW is the largest domestic jurisdiction with the opportunity to appropriately marshal all participants (including the major brands) at the highest level.

In developing an initial “road map” for the transition to a circular economy, the NSW Government must be prepared to countenance a much wider range of views around resource management than has been historically necessary. In the context of the current resource management crisis, it is imperative for all sides of politics and all economic interests to commit to their respective 20-year roles in order to achieve the transition we seek.

Resource Recovery Market Failure – A Call for Government Intervention

Supply of quality recyclates to the manufacturing sector is almost entirely dependent on the brands/brand owners having confidence in a sufficiently mature recyclate manufacturing sector capable of providing:

1. Recyclate materials of the agreed quality;
2. Recyclate materials in the quantity and long-term reliability of supply necessary to meet the defined “virgin replacement” or “virgin supplementation” requirements over the logical production run of a finished product or service; and

3. Recyclate materials available at an agreed price benchmark that reflects –
    a) The price of virgin alternatives; and
    b) The circular economy/sustainability properties so valuable to the brands when marketing to their customers and/or observing their responsibilities/commitments to Governments.

The brands may be reluctant to commit to systematically procure high quality recyclates when no corresponding or adequate recyclate manufacturing sector exists, and the existing urban waste processing sector may be unwilling to tool up to supply a potential market that cannot be readily identified and secured. This situation might be defined as a basic "market failure". Surely a situation where resources have negative value would constitute market failure in any other industry or field of economic endeavour. Where manifest market failure exists, it is incumbent upon Government to coordinate an active response.

The importance of Government intervention in overcoming "market failure" cannot be overstated in the establishment of education, health, utilities and transport systems. Privatisation may occur later but our education systems, our health systems, our provision of utilities and transport systems would likely never have succeeded in the way they have, without Government being highly active in overcoming initial market weaknesses in infrastructure provision and market establishment/development.

Establishment of a progressive, stable policy and regulatory framework are understood to be important prerequisites to investment by business and industry. However, in like manner to the education, health, utilities and transport systems before it, the circular economy is not likely to magically appear just because Government has the correct regulatory and legislative settings. The Government role in seeking to establish a circular economy will of necessity, be more pro-active. Any reasonable assessment of the early isolated successes in introducing circular economy principles in a European context, would lead to this inescapable conclusion.

Reaching all the Requisite Societal Groups

The ambition of a renewed NSW approach to recycling and waste should be to foster the creation of a comprehensive resource management system. The AIEN would be supportive of all policies contributing to that outcome.

The objectives of a holistic circular economy approach to resource management must include:

- Clear obligations upon manufacturers, importers, distributors and other persons in relation to the mechanism by which 'waste' is to be avoided or eliminated from the utilisation of their products. A greater emphasis on product and packaging design is required. The current product stewardship regime is not considered to be adequately driving improvements to product design and packaging design to ensure reuse and recyclability.
- Clear obligations upon manufacturers, importers, distributors and other persons in relation to the mechanism by which 'waste' is to be harnessed as a resource for reuse and or recycling. (These are higher order resource utilisation options than either treatment or disposal.)

- Clear obligations upon manufacturers, importers, distributors and other persons in relation to the mechanism by which 'waste' impacts on the environment are to be minimised or how the overall greenhouse inventory (product creation, use, recycling, treatment, disposal, etc) of products is to be minimised.

Existing policies and resource management frameworks have primarily focussed upon raising awareness and placing obligations upon manufacturers, importers, distributors and other persons in the following important areas:

- Separation and segregation of materials/components so as to avoid contamination;
- Aggregation of post-consumer materials/components; and
- Initial treatment of the post-consumer materials/components (in some cases).

However, the other important pre-requisites for a circular economy include identification and/or establishment of processes and infrastructure to enable the materials/components to be reused and/or recycled and the establishment and support for consumer markets for the reused and/or recycled materials/components.

A holistic Australian approach must incorporate these additional elements in order to successfully move toward a circular economy.

Initiatives promoting circular economy principles will be inadequate, and ultimately fail, where they collectively fail to:

- Sponsor and/or promote resource utilisation facilities and technologies. Product stewardship schemes that can aggregate waste (at least contributing positively to litter reduction) while the materials/resources carefully separated and segregated by others are ultimately destined for landfill due to the underdeveloped nature of local/domestic recycling and resource reuse industries is still considered failure.
- Reward organisations/entities genuinely promoting recycling and reuse industries through their purchasing/procurement decisions.

Mechanisms for Government to Stimulate a Circular Economy

As mentioned on page 2, the updated national waste policy sets 2030 targets for recycling rates and the quantities of materials to be recycled. This is to apply as an "average recycled content" across all products in the economy. The NSW Government could do a great deal to foster the emergence of a circular economy in NSW although the AIEN recognises the responsibility for ultimately supporting, maintaining and growing the circular economy will rest with business and industry. That said, what can the NSW Government do now?

Some potentially valuable initial actions might include:

1. Initiate and facilitate direct discussions and negotiations between the parties to at least ensure that both parties are fully aware of the potential; and
2. Provide some initial base line markets for a selected range of quality recyclate products, thus giving initial confidence to the recyclate manufactures that their investment in the

retooling will achieve base line outcomes, both as a platform for the future potential demonstrated by the brands, and providing the brands the confidence to re-design and respecify future product ranges that would optimise virgin material replacement/supplementation.

As a strategic preference, the primary motivational driver for each stakeholder and actor to contribute to the timely and efficient achievement of a circular economy should remain, their fully informed self-interest. But to establish this logical alignment of interests there is an enormously important role for Government, in order to address existing market failures.

Further Government actions could include:

- Appropriate utilisation of Government procurement power; and
- Introduction of selective bans on items that interfere with resource recovery systems.

Utilising Government Procurement Power

Currently (2018), the Government sector spending in NSW accounts for 20.5% of the NSW gross regional product (GRP) of $604.4 B. If the NSW Government has an appetite for leadership in fostering the emergent circular economy, there must be some component of the $124.36 B in Government expenditure within the State that could be directed toward procurement of high-recycled content goods.

All Government would be required to do is:

1. Determine what goods it currently procures are both imported and produced from virgin raw materials.
2. Set domestic specifications for selected products and product lines identified in 1. above.
3. Set the price point it is prepared to pay for the selected products and product lines that meet the specifications set.
4. Award contracts to those using greatest recycled content where their quoted item prices are competitive with those previously manufactured from virgin resources/raw materials.
5. Cost neutral **AND** fostering a circular economy!!!

A degree of certainty regarding markets and market volumes will unlock investment in recycled product manufacturing within the State. It is unlikely the necessary infrastructure investment in production capacity will be forthcoming until there is a clear signal regarding markets for products, clear specifications for those products, etc. The AIEN is aware of several potential manufacturing infrastructure projects (for NSW) that are not currently proceeding due to the difficulty in negotiating firm off-take agreements for their proposed products. The NSW Government could readily demonstrate leadership in this key area of market development for goods produced from recycled content at minimal public cost.

There are some instances of this occurring amongst the Brands (manufacturers) and within industry more generally. However, Government signals and demonstrations of commitment would constitute powerful signals within the economy.

Examples of products potentially eligible for consideration in such a procurement regime might include (but should certainly not be limited to):

- Recycled timber substitute products for fencing, parks, gardens, walking paths, posts, bollards, etc.
- Railway sleepers and railway infrastructure items.
- Asphalt and road base additives.
- Organic fertilisers for gardens and parklands.
- Masonry and stone substitute products for paving, decorative facias, etc.

Selective Bans on Items that Interfere with Resource Recovery Systems

Presently, there are problematic materials being used that cannot be reliably removed from waste streams. The presence of these materials is resulting in the diversion to landfill of large quantities of otherwise recyclable materials.

In the specific area of plastics recycling, examples of these contaminating materials include:

- PVC (present in a small proportion of beverage containers); and
- Coloured PET.

Even in small quantities, these contaminants destroy the value and markets for large volumes of otherwise recyclable plastics. In line with international trends and actions (for example, Japan, South Korea, France and California), the AIEN recommends that all Australian jurisdictions move rapidly toward banning PVC, coloured PET in drink containers and other plastic materials that adversely impact on current domestic recycling systems.

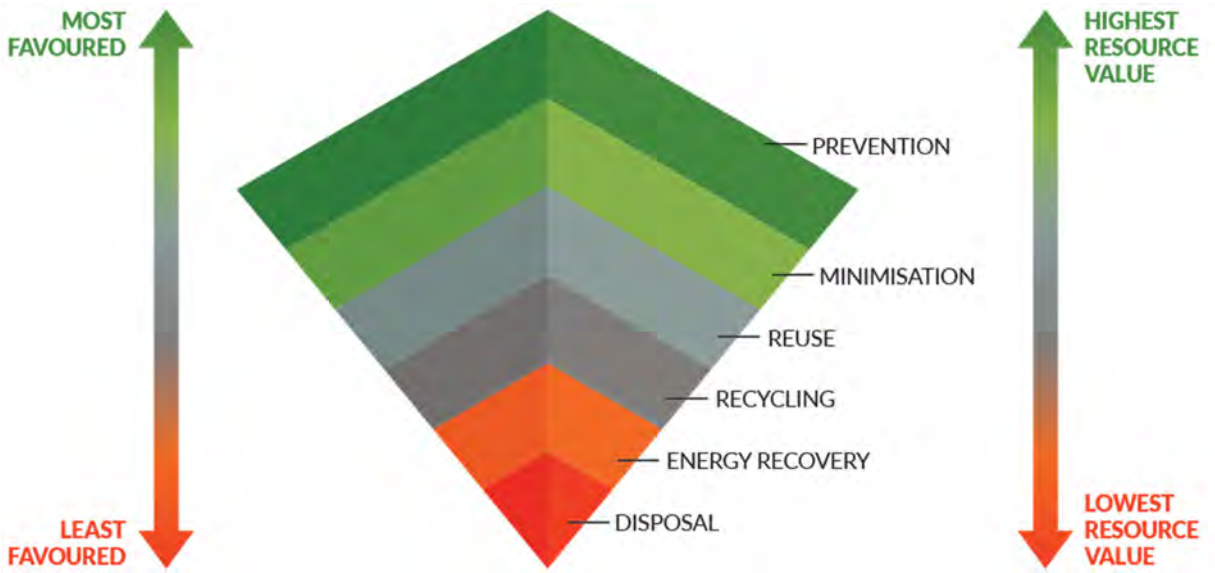
Consultation with the MRF operators would reveal a significant number of like issues across all components of the waste stream. We simply need to be smarter in order to give ourselves a chance of developing a circular economy, free from unnecessary and limiting impediments.

Prioritisation of Opportunities – The Power of HNRV

There are opportunities and technologies available for the recycling/reuse of mixed plastics, rubber, glass, timber, aggregates, etc as valuable resources in higher value add product markets. Further, the AIEN endorses the concept of Highest Net Resource Value (HNRV) as worthy of detailed consideration and promotion. It is a concept enshrined within the waste hierarchy, but with a more tangible and measurable output.

HNRV reflects an approach that seeks to achieve or retain the highest possible resource value from the materials under consideration, “net” of the cost and effort to achieve such an outcome.
The waste hierarchy is normally presented only in the context of environmental/social good. The AIEN has re-imagined the waste hierarchy as representing the notional value applied to a given ‘resource’. At the low-end, disposal to landfill implies the generator places a negative value on the resource. At the high end the generator places full commercial value upon the resource through avoidance and/or minimisation.

When assessing any competing resource utilisation technologies, application of HNRV should provide initial guidance. All other things being equal (such as the appropriateness of scale, resource availability, etc), priority should be afforded technologies and outcomes that place the highest value upon the resource under consideration. This also applies to prioritisation of alternatives at the same level in the hierarchy.



Any failure to properly consider the importance of the waste hierarchy and HNRV principles may result in losses in the longer term through stranded investment. When resource availability becomes a constraint, resources will always flow to those who can afford to pay the most for them. This is the major reason the AIEN is concerned by the potential over-investment and reliance upon waste to energy technologies, such as has arguably occurred in some European jurisdictions. Resources should always be applied where they achieve their HNRV. Once the HNRV application has been fully exploited, the optimal operation of a circular economy would see the resources stream/cascade to the next best utilisation, and so on until the resource has been exploited to the maximum possible extent.

In certain circumstances, including remote geographic location, small and highly diffuse resource quantities, etc, there may be valid arguments that energy recovery represents the HNRV achievable for resources otherwise considered as wastes. However, it would be lazy in the extreme to settle for lower resource values simply for ease and expedience. Energy from waste should only be considered where:

- HNRV alternatives have been fully saturated with the resources they require. This means energy recovery activities are restricted to “residual” resources not required by the higher value adding processes; or
- Where very unusual circumstances are such that energy recovery is the only feasible process for the recovery of economic value from resources that would otherwise be wasted in landfill.

Cross Jurisdictional Imperatives – That old issue just keeps resurfacing

It is almost inevitable that undesirable and unforeseen consequences will arise at borders, where the Australian jurisdictions fail to act in concert.

Some appalling outcomes associated with otherwise positive policy initiatives include:

- The transboundary truck movements of waste that resulted from NSW and Queensland not moving together in relation to landfill levies; and
- The transboundary beverage market disadvantages being suffered on the NSW side of the border due to the introduction of CDL in NSW and not in Victoria. Beverage sellers currently face lower costs on the Victorian side, so the good residents of Victoria pay less for their beverages in Victoria (CDL component free) and claim the refund by recycling those containers on the NSW side of the border.

In Summary

There is much the NSW Government can do to assist and foster the emergence of a circular economy in NSW. The AIEN looks forward to the opportunity of working with the NSW Government in assisting to establish a world class resource management system.

Yours faithfully,

Colin Barker
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Australian Industrial Ecology Network