Catalyst to achieving a circular economy

Submission to the

Cleaning Up Our Act: The Future for Waste and Resource Recovery in NSW

Issues Paper (March 2020)

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Introduction

Thank you for the opportunity to provide a submission to the *Cleaning Up our Act: The Future for Waste and Resource Recovery in NSW Issues Paper.* As previously expressed to the NSW Minister for Energy and Environment, Matt Kean by letter (September 2019 - attached), the AIEN both congratulates and encourages the NSW Government's efforts to explore and address the issues associated with resource management. In particular, the issue of building NSW's capacity to minimise waste, manage material flows and generate demand for commodities produced from recyclates. The AIEN considers the collective response must be collaborative, comprehensive and coordinated if NSW is to emerge from its current waste/resource management predicament.

As cited in the *Issues Paper* NSW will need:

- To value its resources, use and reuse them for longer in order to incentivise and empower the reuse market;
- New technological and service solutions that realise more value from waste and avoid or lessen the environmental costs of waste generation and disposal; and
- Waste and resource recovery systems and services to operate flexibly so they can adapt to changes in technology, economic activity and the way communities use their living and public places.

Throughout the *Issues Paper* narrative, many laudable objectives are announced. The AIEN is supportive of the overwhelming majority of these objectives. However, when explored in greater detail, often the actions and activities proposed fall short of what is both possible and desirable in NSW within a 20 year timeframe. Where this occurs, commentary is provided within this submission that describes higher aspirational targets that are possible within NSW.

The AIEN acknowledges the NSW Government has provided opportunity to answer specific questions and provide feedback on-line. However, the AIEN embraces this additional opportunity to forward further commentary with regard to its ideas previously forwarded to Minister Kean in September 2019. Following are the AIEN's immediate thoughts in relation to the treatment of those issues within the *Cleaning Up our Act: The Future for Waste and Resource Recovery in NSW Issues Paper*.

As always, the AIEN would be pleased to provide additional information or clarification of any points if/as required.

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Attachments

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.

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, AIEN does whatever it can to further the cause of Industrial Ecology and be a catalyst for change to promote the transition to a Circular Economy. Currently the AIEN is investigating the prerequisites for successful change through bringing together key stakeholders with a view to identifying criteria for new Circular Economy initiatives.

Industrial Ecology (IE) and Sustainability

The overarching aim of IE is the sustainability of economically developed and developing societies. Theoretical IE is concerned with the principles, concepts and techniques for analysis that help us understand the myriad interactions between humans and the natural environment. It is axiomatic that for human existence to be sustainable, human activities must be compatible with environmental sustainability. If we wipe out the species on which we depend for survival or destroy their habitat or render unviable the natural resources that support our way of life, then our species will not be sustainable.

Sustainable development is the route to achieving sustainability, essentially by bringing about intended changes in human behaviour. That is the focus of IE in practice and arguably its ultimate objective. If IE is not applied in practice, and particularly with stakeholder 'license to operate', sustainable development has no chance of happening either.

1. Comments on the Issues Paper Overview Narrative

Item 1 - Issues Paper Quotation ('Rationale' page 4)

Quote

"If we don't act to disrupt this trend and ensure we have the infrastructure capacity needed to manage our waste, there is a risk that NSW's waste systems will not be able to cope. We do not yet have the processing capacity to recycle the 240,000 tonnes of waste we have been exporting each year, and our landfills are expected to reach capacity in the next 10–15 years."

Comment/Response

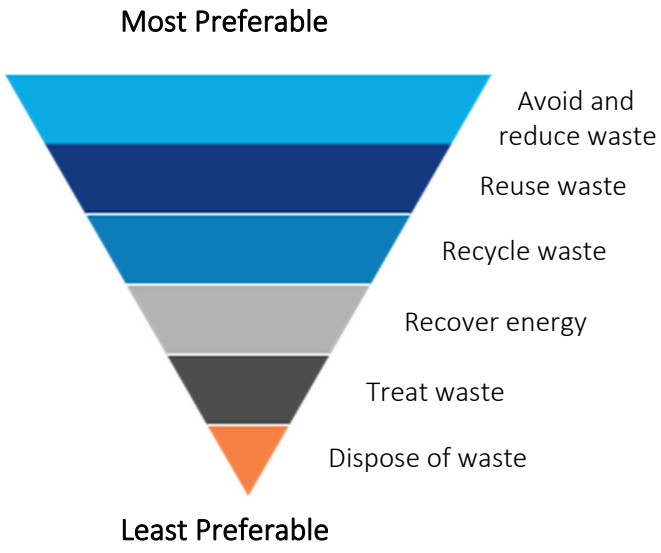
In this submission the AIEN seeks to describe and contrast the types of "traditional" waste management infrastructure from the new and "disruptive" systems and infrastructure that will be essential to support the realisation of the highest value recovered resources in a fully functioning Circular Economy.

Item 2 - Issues Paper Quotation (page 5)

Quote

"The waste hierarchy shown in Figure 1 provides an order of preference for managing waste materials. Without exploring and implementing different ways to manage our growing volume of waste, management will inevitably flow to the 'least-cost' disposal pathway, which may not be the most preferable for our communities or create value in waste resources."

Figure 1. The waste hierarchy



Comment/Response

The AIEN congratulates the NSW Department of Planning, Industry and Environment (NSW DPIE) in affording the waste hierarchy a position of primacy at the outset. This is only proper in reflecting upon the relative merits of available resource management options. At AIEN we refer to this waste hierarchy by the term Highest Net Resource Value (HNRV) which seeks to achieve or retain the highest practical resource value from any materials under consideration, "net" of the cost and effort to achieve such an outcome. When

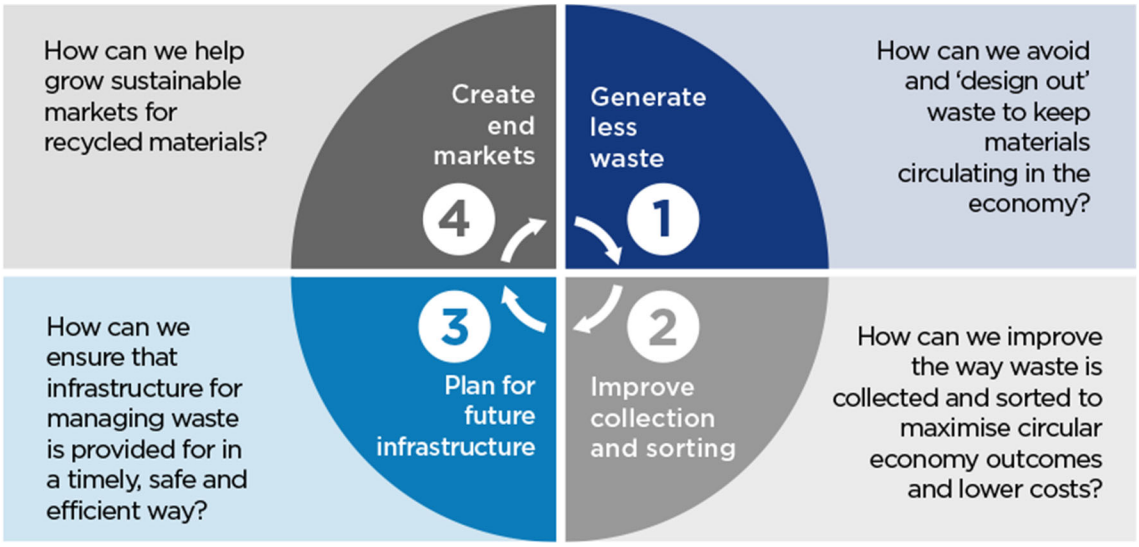
considering waste hierarchy issues in this submission we will refer to HNRV as shorthand for this more generally complex and integrated issue. Further commentary will be forthcoming based upon this primacy. Suffice to say that later recommendations and actions lack consistency with this ideal.

Importantly, the NSW DPIE has correctly recognised the likely 'race to the bottom' (code for least cost processing) in the event that existing markets forces acting alone in dictating resource management outcomes. The AIEN interprets this as a self-confessed justification for Government guidance to be exercised to ensure beneficial social outcomes ultimately result.

Item 3 - Issues Paper Quotation (page 6)

Quote

"Figure 2: - Alignment of 20-Year Waste Strategy directions with a circular economy approach"



Comment/Response

The AIEN is gratified the NSW DPIE is promoting activity right around all elements of the entire circular economy (CE). Whether this is indeed balanced will be revealed in the later detail. Further commentary will be forthcoming based upon the observed alignment with truly promoting a CE. Suffice to say that later recommendations and actions lack consistency with this ambition.

Item 4 - Issues Paper Quotation (page 6)

Quote

"Direction 1: - Generate less waste by avoiding and 'designing out' waste, to keep materials circulating in the economy."

Comment/Response

It has been, and it remains wrong, to design recycling infrastructure to cater for more resources than need be generated. This remains consistent with the promotion of the higher waste hierarchy values. Once again, suffice to say, that later NSW DPIE recommendations and actions lack consistency with this ambition.

That said, the AIEN is extremely supportive of a focus toward implementing structural improvements at the initial consumer product design and initiation stages, especially in relation to:

- Ensuring optimised quality recyclate materials are included in the manufacture and packaging of all items; and
- Demonstrating the envisaged post-consumer design intent is consistent with available and operational material discard and recovery options.

Item 5 - Issues Paper Quotation (page 6)

Quote

"Direction 2: - Improve collection and sorting to maximise circular economy outcomes and lower costs."

Comment/Response

Improved selection and sorting can only improve CE outcomes where markets exist for the improved quality materials. Improved collection and sorting should not be viewed as an end in itself, but must be highly linked to market creation/expansion. More will be added in assessing the later actions and options available to the NSW DPIE. In addition, the collection and sorting systems need to be nationally consistent to ensure informed community participation and compliance. This proposed standardisation will also result in greater value recovery from the recycled resources.

Item 6 - Issues Paper Quotation (page 6)

Quote

"Direction 3: - Plan for future infrastructure by ensuring the right infrastructure is located in the right place and at the right time."

Comment/Response

If the NSW Government's policy reach is intended to fully address and promote the requirements of a circular economy, then infrastructure must include all necessary infrastructure. In a holistic assessment of Figure 2, the requirements for infrastructure must include the requisite infrastructure at each of the four quadrants. It is not considered to be the Government's role to specify the plants and processes required to fully address the needs of quadrants 2 and 3, however, the Government's role must endeavour to leverage the investment of others by being active in market creation. On page 40 of the *Issues Paper*, the example of Denmark is cited as being of relevance in the creation of end markets. The AIEN urges the NSW DPIE to fully explore the Danish example as a template for market creation. Specifically, it is recommended the Danish Government role in market creation be utilised as a template for Government action in NSW. More information regarding the Danish Government's active role in end market development can be found at: https://www.ellenmacarthurfoundation.org/case-studies/denmark-public-procurement-as-a-circular-economy-enabler

Whilst not requiring Government investment directly in manufacturing infrastructure, Government procurement policy can have an enormous impact in leveraging private sector investment. Unfortunately, the *Cleaning Up our Act: The Future for Waste and Resource Recovery in NSW Issues Paper* does not make any commitments in utilising the procurement leverage available to Government.

Item 7 - Issues Paper Quotation (page 6)

Quote

"Direction 4: - Create end markets by fostering demand for recycled products in NSW (particularly glass, paper, organics, plastics and metals) so that recovered materials re-enter our economy and drive business and employment opportunities."

Comment/Response

The Danish example shows there is significant scope for Government to play an active role in leveraging market creation. The options cited (Option 4.1 through to Option 4.4) are all good in and of themselves. However, in aggregate they fall far short of the role played by the Danish Government initiatives that have utilised Government sector procurement as a CE enabler. In the absence of specifying what the NSW Government will buy (provided quality requirements/specifications are met) and at what price point, the domestic private sector investment sought will remain aspirational. When citing the successes of the Denmark example, the NSW Government is encouraged to embrace them fully. See the comments/response under Item 6 (page 4).

2. Comments on Direction 1 – Generate Less Waste

Item 8 - Issues Paper Quotation (page 10)

Quote

"While there is a high degree of recycling in the construction industry (where materials are returned to roads and buildings), recovery and recycling in household, commercial and industrial waste streams have plateaued. NSW is not on track to meet 2021 targets to divert waste from landfills. As shown in Figure 6, construction and demolition waste recovery is around 77% (on track to meet the 80% target), while commercial and industrial waste and municipal and solid waste recovery are each around 40–50% (below the 70% target)."

Comment/Response

The AIEN congratulates the authors of the *NSW Government State-Wide 20-Year Waste and Resource Recovery Strategy- 2020 Issues Paper* on the candid nature of the above statements. In the context of generating less waste they are valid and supported by the AIEN. Generating less waste represents the 'most preferred' objective as presented in Figure 1 within the *Issues Paper* document.

As will be discussed in response to Item 22 (Option 2.3) below, perhaps the biggest single area for significant improvement in MSW recovery rates relates to appropriate Product Stewardship of durable products and bulky items. Whilst the green bin (organics) recovery systems are well defined and the yellow bin recovery system for dry recyclable packaging is also receiving much attention, there is a significant fraction of the MSW stream reporting to the red bin system as the default discard option. Unfortunately, a wide range of materials cannot be appropriately processed/value recovered via this 'last resort' discard pathway.

Item 9 - Issues Paper Quotation (page 11)

Quote

"The second-hand economy for reusing goods is estimated to be worth $43 billion to Australia and is growing. Each household has an estimated 23 unwanted or unused items with a total average resale value of $5,300. This presents an opportunity to avoid adding to waste."

Comment/Response

The AIEN fully supports the objective of facilitating the reuse of resources where avoidance and minimisation activities/actions have been fully implemented. Implementing reuse strategies represents the second highest preferred objective as presented in Figure 1 within the *Issues Paper* document. Once again, this issue is addressed in the response to Item 22 (Option 2.3) below.

Item 10 - Issues Paper Quotation (page 11)

Quote

"The discussion paper Cleaning Up Our Act: Redirecting the Future of Plastic in NSW, released at the same time as this Issues Paper, is the first step in developing a new, comprehensive approach to managing plastic waste and pollution in NSW. The discussion paper will inform the development of the NSW Plastics Plan aimed at protecting the environment and human health from the impacts of plastic waste in NSW, while minimising impacts on consumers and maximising the economic opportunities available. It will be an important part of the NSW 20-Year Waste Strategy."

Comment/Response

The AIEN will address this issue specifically in another submission specifically addressing the *Cleaning Up Our Act: Redirecting the Future of Plastic in NSW* discussion paper. The AIEN agrees the issue of plastic waste requires targeted management but also recommends these specific actions and initiatives must be fully consistent with every aspect of the *NSW 20-Year Waste Strategy.*

Item 11 - Issues Paper Quotation (page 12)

Quote

"More can be done to reduce waste and improve materials recovery through producer-led initiatives to phase-out problematic materials and redesign products so they can be readily recycled."

Comment/Response

On page 8 of the AIEN letter to the NSW Minister for Energy and Environment, Matt Kean by dated September 2019 (attached), the AIEN advocated for selective bans to be implemented on problematic materials citing coloured PET and PVC beverage containers as particular examples. The AIEN fully agrees and supports the phasing out of problematic materials that are themselves not recyclable but also contaminate and interfere with the effectiveness of existing recycling systems.

Item 12 - Issues Paper Quotation (page 13)

Quote

"Across Australia, about one million tonnes of NSW food and garden waste and 570,000 tonnes of textile waste are sent to landfill every year. The decomposing material releases methane that may not be captured. However, when this waste is managed effectively, through proper composting and recycling processes, methane emissions can be greatly reduced, soils can be regenerated to store carbon and biogas can be created to generate electricity."

Comment/Response

The AIEN fully supports all initiatives for the improved management of carbon. In particular, the correct management of organic carbon is considered an essential ingredient of a successful circular economy. Ultimately, a carbon cycle must be established whereby carbon is returned to agricultural soil profiles in major food bowl areas. The carbon should be returned to soils as humus (easily bio-available), to promote wetting and water retention properties, to promote healthy microbial activity and for sequestration purposes. Correct utilisation of methane as it arises (utilisation as fuel) and reducing methane emissions through composting are good initial steps. However, the AIEN would urge the NSW Government to see beyond these initial steps and to seek ongoing initiatives with long term soil health within the State as its ultimate goal.

Item 13 - Issues Paper Quotation (page 14)

Quote

"With the success of recent NSW litter reduction programs and the high level of community support, it is critical that we capitalise on the opportunity to reduce litter further."

Comment/Response

Litter reduction initiatives are always supported by the AIEN. However, litter is a problem largely because used resources generally have no market value. This is why fostering 'market pull' is so important. (See pages 3 and 4 of the attached AIEN letter to the NSW Minister for Energy and Environment, Matt Kean dated September 2019.) The NSW Government's CDL scheme is a testament to the importance of value being attached to resources and the consequent reductions in litter that will naturally follow. Just imagine how litter reduction would be enhanced if all used resources commanded a residual value. We must strive for this.

Item 14 - Issues Paper Quotation (page 15)

Quote

"The NSW Plastics Plan discussion paper proposes several new targets relating to plastics:

- *phasing out key single-use plastics*
- *tripling the proportion of plastic recycled in NSW across all sectors and streams by 2030*
- *reducing plastic litter by 25% by 2025*
- *making NSW a leader in national and international research on plastics.*

These proposed targets aim to reduce plastic waste generation, make the most of our plastic resources, reduce plastic waste leakage, and improve our understanding of the future of plastics."

Comment/Response

NSW is a leader in the development of many first class international technologies in plastics, glass, organics, biomass, etc. Some of these technologies have been developed through the established research institutions within NSW. However, there are other first class international technologies developed within NSW by private interests. It remains a tragedy that NSW has been unable to capitalise upon these opportunities despite $800M + being allocated to resource management improvements in recent years. The inability of the NSW Government to support its resource management technology inventors is, by many, considered scandalous.

The AIEN will address the plastics issue specifically in another submission specifically addressing the *Cleaning Up Our Act: Redirecting the Future of Plastic in NSW* discussion paper. However, there are NSW based plastics reprocessing technologies among the first-class international technologies that have failed to attract the interest of the NSW Government.

With regard to the establishment of Government targets (whether relating to plastics or otherwise), the AIEN urges that all targets be based upon a framework of actions that enable those targets to be achieved. Given the primary role of government is to facilitate, coordinate and regulate, much of the crucial role for determining the eventual post-consumer fate of all materials currently present in urban waste streams must also rest with the original product manufacturers. Thus, the existing "waste removal and disposal" based

systems must be radically updated to perform as reliable, community accessible, aggregation and materials management systems. This radical overhaul in purpose and thinking will allow these same product manufacturers to rely upon the availability of suitable recycled content when initiating and designing their product offerings.

Item 15 - Issues Paper Quotation (page 16)

Quote

"….identifying priority products that would benefit from mandatory extended producer responsibility."

Comment/Response

The AIEN supports the NSW Government in its endeavours to identify those products and markets that would benefit from the imposition of mandatory extended producer responsibility requirements.

As previously described in Item 7 (page 5), significant scope exists for Government to also play an active role in leveraging market creation. Government has a responsibility to legislate (the 'stick' approach) the imposition of mandatory extended producer responsibility requirements where necessary. However, Government has an equal responsibility to assist in market creation (the 'carrot' approach) in order to avoid the imposition of extended producer responsibility obligations that are not necessary.

The AIEN urges the NSW Government to work with manufacturers, importers, etc in a balanced way. It will not be helpful in the longer term if Government continues to place additional regulatory obligations on other sectors of the economy, while not demonstrating preparedness to assist in the creation of the improved resource management opportunities it seeks to mandate.

To 'design out waste' must be predicated upon establishing a dialogue with the producers of all the products that currently present primarily within the collective urban waste streams. To 'design out waste' must also include re-engineering the post-consumer collection and re-aggregation activities to help product producers achieve the particular end-of-first-life outcome that was included in the fully considered initial design.

In relation to product stewardship priorities, where a fully developed red, yellow and green bins materials flow system will still not accommodate any particular waste arising (because it may be too toxic, too durable/bulky, too valuable etc) then alternate level of product stewardship material recovery arrangement must be developed and implemented.

3. Comments on Direction 2 – Improve Collection and Sorting

Item 16 - Issues Paper Quotation (page 19)

Quote

"Currently, each local council specifies its own sorting requirements for collection, including bin configurations and the types of waste accepted for recycling. While all councils provide a red bin, 87% provide a co-mingled recycling bin and 63% provide a bin for garden organics or food and between resource recovery outcomes against collection and other costs. However, this creates challenges for source separation as residents have diverse experience in what can and cannot be recycled as they move between areas. Lack of awareness, confusion over what goes in which bin, and limited opportunities for source separation in some councils, can increase contamination of the waste that is collected. There is opportunity to improve this, particularly as 82% of households are willing to recycle, even when it takes more effort. Almost 50% of illegally dumped waste is household waste garden organics (Figure 8). What can go into the recycling bins (green-lid and yellow-lid bins) varies across local councils, depending on their individual waste processing arrangements. For example, some councils with green-lid bins accept both food and garden organics in the same bin, some only garden organics, and some have a separate food organics collection service."

Comment/Response

The AIEN support all initiatives that will create markets or support markets for recycled products. That support extends to both new and existing markets. Separation at source is clearly a key activity in preserving the value of resources that would otherwise likely be forgone. The most important source separation initiatives required are:

- The separation/segregation of food wastes and organics; and
- Ensuring there is uniformity of collection systems across local government areas.

And as will be discussed in response to Item 22 (Option 2.3, page 13), the logic of harmonising the commonly available discard systems, needs to be matched to the resource recovery/reprocessing options that are available for each resource component.

For example:

- What is encouraged into the green-lidded bins must be entirely suitable as specified feedstock into the organics processing facilities that serve the various jurisdictions and simple composting may not be the optimum choice in an emerging bio economy.
- Likewise, the materials encouraged for discard to the yellow-lidded bin should be nationally consistent to avoid confusion and optimise participation. As a consequence, the downstream MRF processing capabilities also need to be uniform and able to produce quality recyclates meeting published end user purchasing requirements.

Item 17 - Issues Paper Quotation (page 23)

Quote

"Growing consolidation in the waste industry over time has led the Australian Competition and Consumer Commission to note recently that any future merger or acquisition involving any large suppliers of waste management services would be closely investigated. This partly reflects the effects of a decentralised market, where services are procured separately by each local council. A single council can lack purchasing power and, in some instances, the ability to effectively enforce contract terms."

Comment/Response

'Partly' is the operative word in the quotation above. Councils are required (of necessity) to separately source waste management services because the systems and waste services they specify are not uniform. NSW Councils are not an exception here. It is likely the pricing would also be lowered if there was a concerted effort to achieve uniformity in the service delivery to be provided.

Item 18 - Issues Paper Quotation (page 24)

Quote

"Most local councils on their own do not have the volume of waste to meet these thresholds. However, joint procurement by a group of local councils or combined commercial and industrial and municipal solid waste contracts could make investment in infrastructure viable."

Comment/Response

As previously stated, Councils are required (of necessity) to separately source waste management services because the systems and waste services they specify are not uniform. NSW Councils are not an exception here. It is likely the pricing would also be lowered if there was a concerted effort to achieve uniformity in the service delivery to be provided. Before collective bargaining can make sense, achieving uniformity of service provision should be considered a prerequisite.

Item 19 - Issues Paper Quotation (page 25)

Quote

"The waste levy is the key economic instrument used in NSW to discourage landfilling and stimulate resource recovery. Importantly, it makes recycling more cost-competitive relative to landfill disposal. The levy rates in 2019–20 are $143.60 for the Metropolitan Levy Area and $82.70 in the Regional Levy Area. The levy has been highly successful in diverting materials back into the economy. However, as with most such economic levers, it can also experience 'leakage' where waste is transported over long distances to low- or no-levy areas, or illegally dumped. For example, regional councils have reported an increase in the funding needed to clean-up and dispose of illegal waste piles since the introduction of the NSW waste levy."

Comment/Response

The Waste Levy becomes less important where materials retain a residual value throughout their multiple journeys through the economy. The Waste Levy should be considered as a useful deterrent to landfill during the transitional period as we move toward a circular economy. Successful as the Waste Levy has been in leveraging certain outcomes in NSW in recent years, we should all be mindful that prolonged continuance of the Waste Levy as a primary behavioural driver means we have collectively failed in introducing a circular

economy. A circular economy will only fully emerge where residual value (the AIEN calls this 'market pull') always exists for materials. (See pages 3 and 4 of the attached AIEN letter to the NSW Minister for Energy and Environment, Matt Kean dated September 2019.)

Item 20 - Issues Paper Quotation (page 27)

Quote

"Option 2.1 Recovering food and garden organics."

Comment/Response

The AIEN fully supports the source separation/segregation of food organics and garden organics within NSW. See the comments/response under Item 16 above.

The AIEN is pleased to note an emerging view within NSW, in relation to recovering maximum value from such organic streams. This evolution in thinking is moving away from basic composting to more sophisticated and higher value adding approaches, including AD, fermentation and torrefaction/pyrolysis.

Item 21 - Issues Paper Quotation (page 27)

Quote

"Option 2.2 Standardise collection systems for households and businesses"

Comment/Response

The AIEN fully supports the standardisation of collection systems for households and businesses within NSW. See the comments/responses under Item 17 and Item 18 (page 11) above which also touch upon advantages potentially realised through service standardisation.

As alluded to in the response to item 16 (page 10) above, a universal nationally coordinate post-consumer discard and collection system is recommended involving:

- Option 1 – Clearly specified dry recycling of packaging in yellow lidded service. NB: perhaps divided into 2 streams to keep glass separate.
- Option 2 – Organics – green lidded service
- Option 3 – Residuals (less option 4 items and materials) red lidded service
- Option 4 – Commonly branded, community facing drop off centres. Located within shopping centres, adjacent to service stations and fast food facilities – BUT NEVER located at or near traditional waste facilities or Transfer Stations (ref. Colmar Brunton 2000).

Item 22 - Issues Paper Quotation (page 29)

Quote

"Option 2.3 Network-based waste drop-off centres"

Comment/Response

The AIEN fully supports the NSW option for the establishment of a network of waste drop-off centres. The implementation and promotion of easily accessible consumer drop-off points is urgently required in order to drive effective collection of bulky and problem wastes.

Per the response to Item 21 (page 12). All detailed research in this space confirms that community understanding and active participation is seriously compromised where a plethora of options and systems are prevalent. The discarding of Option 4 materials must be associated with the establishment of 'bring back' facilities and they must be suitably located for the desired effect.

Item 23 - Issues Paper Quotation (page 30)

Quote

"Option 2.5 Innovation and 'waste-tech'. We need to engage actively with research organisations, universities, start-ups, industry and the general community to accelerate innovation and the adoption of new technologies. NSW has world leading research, technical and translational capabilities that could be leveraged to solve technical and non-technical challenges. Collaboration is already happening through, for example, the NSW Circular Economy Innovation Network and CSIRO, and some councils have 'smart city' initiatives."

Comment/Response

As described in the comments/response in Item 14 (page 8), NSW is a leader in the development of many first-class international technologies in plastics, glass, organics, biomass, etc. Some of these technologies have been developed through the established research institutions within NSW. However, there are other first-class international technologies developed within NSW by private interests. It remains a tragedy that NSW has been unable to capitalise upon many of these opportunities despite $800M + being allocated to resource management improvements in recent years. The AIEN would be pleased to introduce the NSW Government to many of the proponents of these world class technologies it has thus far not meaningfully connected with. It will be the NSW Government's loss if/when overseas/interstate interests realise the potential of these technologies and offers their support.

The resource management revolution we collectively seek will not be realised through adherence to a 'business as usual' approach. It is time for Australian Governments (including the NSW Government) to expand the number of voices being utilised as counsel in the field of resource management. A significant opportunity will be missed if the existing Government advisory bodies/interests are the only voices to be consulted.

Item 24 - Issues Paper Quotation (page 31)

Quote

"There is an opportunity to explore mechanisms to combine commercial and industrial waste collection services to support Option 2.6."

Comment/Response

The same generic materials are present in both the C&I and MSW waste streams (e.g.: biomass; synthetics/plastics; metals; inerts; toxic materials; individually valuable items (needing systematic aggregation) and bulky durable items.

MSW materials can retain much of their potential value as reprocessed materials if collected and processed per the four options mentioned (Item 16, page 10).

In the case of the smaller C&I waste generators referred to in Option 2.7, it is the practise of the existing front lift bin operators to mix these C&I sources purely in the interests of collection convenience. For example:

- A fruit market will present packing crates and biomass.
- A printer will present mostly P&C and toner cartridges.
- A panel beater will present mostly meal scrap and paint tins.
- A furniture store will present mostly tertiary packaging from the bulk transporter.

In this situation, all of these semi homogenous C&I wastes become seriously devalued as a reprocessing prospect by the simple act of mixing in the front lift vehicles. This devaluing occurs purely in the interests of 'collection efficiency' rather than presentation of optimised resource recovery potential. AIEN would be pleased to provide some views on exactly how this situation could be addressed.

Item 25 - Issues Paper Quotation (page 31)

Quote

"Option 2.8 Economic incentives and the waste levy"

Comment/Response

The biggest economic incentive will be forthcoming once strategies to promote market pull are maximized. Look at the current situation with oil markets and the glut briefly creating negative value. We just accept this as being business as usual with 'waste' and don't even discuss how we can promote those initiatives that will create value.

As described in the comments/responses to Item 19 (page 11), the Waste Levy becomes less important where materials retain a residual value throughout their multiple journeys through the economy. The Waste Levy should be considered as a useful deterrent to landfill during the transitional period as we move toward a circular economy. Successful as the Waste Levy has been in leveraging certain outcomes in NSW in recent years, we should all be mindful that prolonged continuance of the Waste Levy as a primary behavioural driver means we have collectively failed in introducing a circular economy. A circular economy will only fully emerge where residual value (the AIEN calls this 'market pull') always exists for materials. (See pages 3 and 4 of the attached AIEN letter to the NSW Minister for Energy and Environment, Matt Kean dated September 2019.)

4. Comments on Direction 3 - Plan for Future Infrastructure

Item 26 - Issues Paper Quotation (page 32)

Quote

"Additional waste and resource recovery capacity is needed……"

Comment/Response

The AIEN supports the improvement of separation and segregation infrastructure suitable for the preparation of materials for return to the productive economy. However, the AIEN believes government policy must be directed to all key participant groups in order to realise the circular economy we seek. The AIEN is satisfied that jurisdictional offerings (including those in NSW) have endeavoured to address:

- Product stewardship schemes, product design pressures and consumer behaviour programs in order to minimise the amount of waste being generated; and
- Incentives, supports for better separation/segregation infrastructure and pressures to be placed upon 'waste industry' actors in order to maintain their social license to remain in operation, etc.

In fact, much of the infrastructure spending in all jurisdictions (including in NSW) is directed to separation/segregation technologies, MRF improvements, etc.

However, in relation to the equally key questions of processing and manufacturing infrastructure requirements and market development requirements, the AIEN does not consider NSW (or any other Australian jurisdiction) has provided sufficient support and/or leadership.

The AIEN urges the NSW Government to address some of the key elements of the critical processing and manufacturing infrastructure requirements required and the proactive promotion of market development for recycled products as prerequisites for a circular economy.

Item 27 - Issues Paper Quotation (page 33)

Quote

"Waste and resource recovery lands need to be planned, retained and managed…."

Comment/Response

The AIEN supports the planned and managed allocation of lands suitable for utilisation as resource recovery/separation and segregation infrastructure suitable for the preparation of materials for return to the productive economy. This is a vital prerequisite for the establishment and ongoing maintenance of a circular economy in NSW.

However, equally important will be the planned and managed allocation of lands suitable for utilisation for manufacturing of products derived from the resources recovered. Within the Overview section of the *Issues Paper* (See Item 3, page 3), a stated objective of the 20 Year Waste Strategy is to achieve alignment with a circular economy approach. The AIEN supports this. Planning must include planning for all elements of the circular economy and should not specifically cater for aggregation, separation and segregation activities alone. The China Sword should have taught us all that failure to domestically cater for all elements of a circular economy (including recycled content product manufacturing infrastructure) involves significant risk.

Item 28 - Issues Paper Quotation (page 38)

Quote

"Our waste infrastructure needs will change as we transition to a circular economy. Long-term private capital investment will be critical for NSW to manage waste flows sustainably, including a shift towards higher-value resource recovery."

Comment/Response

The AIEN supports introducing flexibility in waste infrastructure as we transition to a circular economy.

However, within the *Issues Paper* it appears there is an absolute fixation with waste infrastructure as the only infrastructure the NSW Government considers necessary for its consideration. The AIEN urges the NSW Government to remain true to the ideals announced within the *Issues Paper* Overview and consider the entire circular economy (Figure 2) in the context of infrastructure, infrastructure planning, etc.

Certainly, the existing collect for disposal systems and infrastructure, will, at the very least require complete repurposing, if not replacement if these same materials are to be collected to sort and facilitate systematic, market pulled resource recovery.

5. Comments on Direction 4 – Create End Markets

Item 29 - Issues Paper Quotation (page 39)

Quote

"We need to increase our resilience to external shocks."

Comment/Response

The AIEN supports the contention that Australian jurisdictions (including NSW) must increase resilience against external shocks. The impact of the China Sword has undoubtedly sharpened the awareness of the social, environmental and financial risks involved.

The immediate results of the China Sword included:

- A frantic search to find alternate international destinations for our waste (including Indonesia and Malaysia).
- Massive increases in the domestic inventory of waste materials in order to avoid increased costs (landfill charges) impacting upon waste contracts previously signed.

NSW can now observe the desperation of wast companies as they seek to fulfil contractual requirements without their previously available international waste 'sinks'. NSW and Australia will remain vulnerable until such time as true markets are found for recycling/reusing resources derived from waste streams. The least vulnerable markets for the resources will be domestic markets and NSW should be doing everything possible to foster domestic product manufacturing facilities that source raw materials from existing waste streams. So far so good in terms of alignment between this NSW aspiration and that of the AIEN.

Item 30 - Issues Paper Quotation (page 39)

Quote

"There are established or growing markets for some products that are recovered from waste, such as compost (from recovered organics), paper and steel. But demand for other recovered materials like plastics, textiles and glass is less than the volume of waste we generate."

Comment/Response

The AIEN urges the NSW Government to seriously consider the comments/responses already provided under Items 6, 7, 14, 19 and 23. The NSW Government would do well to supplement the pursuit of nominated directions (such as utilisation of waste resources in infrastructure projects) through support, implementation and support for an array of technologies emergent within.

Item 31 - Issues Paper Quotation (page 40)

Quote

"In 2010 the Danish Government established the Partnership for Public Green Procurement, which involves a community of municipalities, regions and public organisations that promotes sustainable purchasing to drive markets to use less environmentally harmful products. The partnership accomplishes this by developing common procurement goals aimed at addressing key environmental issues. These form the basis for the members' individual purchasing policies and procurement agreements."

Comment/Response

The Danish example shows there is significant scope for Government to play an active role in leveraging market creation. The options cited (Option 4.1 through to Option 4.4) are all good in and of themselves. However, in aggregate they fall far short of the role played by the Danish Government initiatives that have utilised Government sector procurement as a CE enabler. In the absence of specifying what the NSW Government will buy (provided quality requirements/specifications are met) and at what price point, the domestic private sector investment sought will remain aspirational. When citing the successes of the Denmark example, the NSW Government is encouraged to embrace them in full. See the comments/response under Item 6 (page 4).

The government must also encourage and work in concert with the private sector with respect to secondary market procurement objectives. The manufacturers are also well placed to establish many secondary markets, given they will be procurers of much of the secondary market 'raw materials'.

Item 32 - Issues Paper Quotation (page 40)

Quote

"There are opportunities to use recycled material in infrastructure projects."

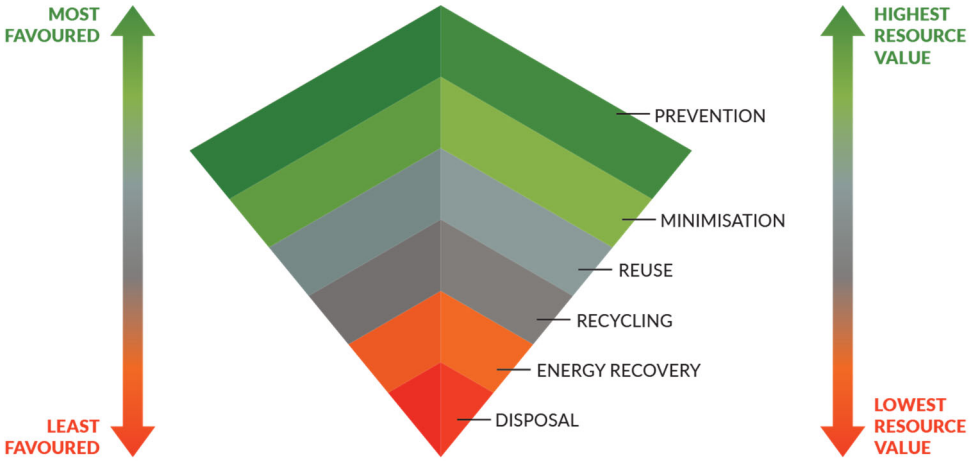
Comment/Response

Given there is a significant and immediate requirement to utilise resources derived from waste streams, the AIEN understands and supports those resources being directed to infrastructure projects. However, in the longer term and in the context of a mature circular economy, such initiatives (using glass as a sand substitute, using plastic as an asphalt additive, etc) are not to be considered as ends in themselves.

A discussion regarding the AIEN's concept of highest net resource value (HNRV) and its importance in assessing the relative merits of recycling options, is commended to the NSW Government. An explanation of the concept of HNRV commences on page 8 of the attachment and is also repeated below due to its absolute importance in considering the merits of utilising products derived from waste within infrastructure projects.

> *There are existing opportunities 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.



As a community, Australia has afforded insufficient attention to recycled product markets. It is recognised the waste hierarchy and the circular economy must be underpinned by markets to utilise reusable and recycled content.

The AIEN would urge all governments (including NSW) to more fully consider rewarding outcomes at the market/recycled product end of the resource management spectrum. Proper consideration of the complete resource recovery/management system (with emphasis on the critical role of markets for recycled products and content) will require/necessitate a significant coordination between waste policy, employment and industry policy, regional investment policy, etc being postulated as an element in a larger resource management picture.

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. Therefore, overinvestment in energy technologies is not recommended.

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.*

Item 33 - Issues Paper Quotation (page 40)

Quote

"….the cost of recycled material is sometimes higher than virgin material, for example plastic packaging and glass sand."

Comment/Response

This statement does represent some truth globally at present. However, several technologies of NSW origin are seriously challenging this past reality. It would be highly desirable for NSW to show some interest in its own home-grown technologies. The AIEN urges the NSW Government to seriously consider the comments/responses already provided under Items 6, 7, 14, 19, 23 and 30. The NSW Government would do well to supplement the pursuit of nominated directions (such as utilisation of waste resources in infrastructure projects) through support, implementation and support for an array of technologies emergent within.

Item 34 - Issues Paper Quotation (page 41)

Quote

"Both the NSW Government and local councils are actively investigating the use of recycled content in infrastructure development. This includes using recycled content in road base, pavements, construction materials, landscaping and sound insulation among many other applications.

Transport for NSW is using crushed concrete, brick and reclaimed asphalt in road base, bedding materials and drainage structures, and has successfully trialled the use of recycled glass in concrete mix for pavements.

Moving forward, there are opportunities to develop or update specifications for other recycled content, such as the use of plastic in construction and road base, which will allow for greater uptake of a wider range of recycled materials."

Comment/Response

Please review the comments/response provided under Item 32 (page 18) above. The utilisation of over abundant resources derived from waste is very attractive at present in solving the existing excess of such materials. However, a correctly functioning circular economy will necessitate 'aiming higher' in terms of HNRV (Also introduced within the comment/response under Item 32 above).

The AIEN would seek the NSW Government to remain true to its *Issues Paper* commitment with respect to its commitment to the primacy of the waste hierarchy. (See comment/response under Item 2, page 2).

Item 35 - Issues Paper Quotation (page 41)

Quote

"Energy recovery can be an option for materials that have limited further market value."

Comment/Response

The AIEN is supportive of NSW remaining committed to the primacy of the waste hierarchy. Energy recovery is fine provided the higher values are first explored and energy recovery truly represents the HNRV available for the resource in question.

Item 36 - Issues Paper Quotation (page 42)

Quote

"New developments like the Western Parkland City, Australia's largest greenfield development area, could provide an opportunity to increase recycled content in construction. Work is expected to start in 2020, and requirements for recycled content will be outlined as part of master plans and procurement. The early lessons from this process could be used to inform other projects and development areas."

Comment/Response

Please review the comments/response provided under Item 32 (page 18) above. The utilisation of over abundant resources derived from waste is very attractive at present in solving the existing excess of such materials. However, a correctly functioning circular economy will necessitate 'aiming higher' in terms of HNRV (Also introduced within the comment/response under Item 32 above).

The AIEN would seek the NSW Government to remain true to its *Issues Paper* commitment with respect to its commitment to the primacy of the waste hierarchy. (See comment/response under Item 2, page 2 above). Only where the utilisation of resources derived from waste genuinely represents HNRV for that resource, the AIEN will always support the application/project. It is anticipated as the circular economy matures in NSW, the utilisation of resources derived from waste within infrastructure projects will become less attractive.

Item 37 - Issues Paper Quotation (page 42)

Quote

"Option 4.2 Standards for recycled content and materials."

Comment/Response

The AIEN will always be supportive of the development of performance/functional standards for products/materials derived from waste. The development of these standards (over time) is critical to moving toward 'market pull' and the assignment of genuine value to those materials within the economy.

Item 38 - Issues Paper Quotation (page 43)

Quote

"Services provided specifically for the resource recovery industry include CSIRO ASPIRE, Planet Ark's National Circular Economy Hub and Marketplace (planned for launch in 2020), and the NSW Circular Economy Network, a NSW Government program to support research and development and innovation for businesses looking to improve materials recovery through advanced re- manufacturing."

Comment/Response

The NSW Government is congratulated for its endeavours in fostering resource recovery service and network groups. Unfortunately, service and network groups were instituted to the exclusion of some existing similarly motivated stakeholders. The AIEN is hopeful that coordination and interaction between all groups will increase over time. The resource management revolution we collectively seek will not be realised through adherence to a 'business as usual' approach. It is time for Australian Governments (including the NSW Government) to expand the number of voices being utilised as counsel in the field of resource management. A significant opportunity will be missed if the existing Government advisory bodies/interests are the only voices to be consulted.

Item 39 - Issues Paper Quotation (page 43)

Quote

"Question 4.4: Are there policy and regulatory improvements that can be made to facilitate innovation and market development in the energy from waste sector, that do not compromise best practice environmental standards?"

Comment/Response

The AIEN has hosted and delivered the Australian Waste to Energy (WtE) Forum in Ballarat annually since 2016. The fifth Australian Waste to Energy Forum (February 2020) was structured to reflect upon the learnings and directions both forged and ventilated at the previous forums. The AIEN has invested heavily in considering WtE issues within the context of its role in a circular economy where primacy is afforded to consideration of waste hierarchy principles. The AIEN would be pleased to discuss its experience and conclusions with the NSW Government.

The AIEN has endeavoured to liaise, and reach out to, the NSW Government in relation to WtE issues. It is regrettable that such endeavours have been unsuccessful thus far.

One key factor in properly scoping the legitimate role for MSW EfW plants is the need to specify and define the nature of a 'post recycling residual' stream of material. Where a fully function bio economy is operational and a synthetics/plastics strategy is fully implemented and a fully functioning Option 4 strategy is available for product stewardship materials and bulky items (see Item 16 above) then a 'post recycling residual' may have very little calorific value. The case for MSW EfW facilities will be highly dependent upon the higher value-add alternatives that can be economically implemented.

Item 40 - Issues Paper Quotation (page 44)

Quote

"The 20-Year Waste Strategy needs an ongoing monitoring and evaluation plan. Key elements of that plan could be:"

Comment/Response

The AIEN supports the development/implementation of improved data collection and information regimes within NSW. However, information collection is only beneficial where it is:

- Properly analysed and interpreted; and
- Acted upon adequately and appropriately.

The AIEN urges the NSW Government to fully commit to the additional data analysis and follow-up action elements of such an initiative.

6. A Successful Circular Economy - Requisite Stakeholder Roles

Industry

A supply of quality recyclates to the manufacturing sector is almost entirely dependent on the brands/brand owners (industry) having confidence and supporting a sufficiently mature recyclate manufacturing sector. That mature recyclate manufacturing sector must be 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;
3. Recyclate materials available at an agreed price benchmark that reflects the price of virgin alternatives; and
4. The circular economy/sustainability properties so valuable to the brands when marketing to their customers and/or observing their responsibilities/commitments to Governments.

The entire concept of creating a circular economy is dependent upon the preparedness of industry to utilise recyclates as their raw materials. In turn, the appetite of industry for change will be governed by consumer acceptance regarding the aesthetics and efficacy of the products they produce.

Government

The brands will be faced with a dilemma in committing to the systematic procurement of high quality recyclates when no corresponding or adequate recyclate manufacturing sector exists. In addition, 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 "chicken and egg" scenario might be defined as a basic "market failure". The current situation where recyclates/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 unlikely to magically appear just because Government has the correct regulatory and legislative settings. The Government role in seeking to establish a circular economy may of necessity, be more pro-active. Any reasonable assessment of the early isolated successes in introducing circular economy principles in a European (especially Denmark and Scotland) context, would lead to this inescapable conclusion.

A key issue that Government must address is the current lack of manufacturing capacity in Australia. With the current levels of product importation there will be more recyclate available than can be absorbed.

Government policy needs to influence a desired outcome whereby there is market for the product, whether that be domestically or overseas.

The AIEN urges the NSW Government to seriously consider the comments/responses already provided under Items 6, 7, 14, 19. 23, 30, 32 and 33 above. Government has a key role in orchestrating the emergence of a circular economy aside from the fact that other stakeholders will also be required to perform their key roles.

Consumers

With encouragement and education from industry and government, all consumers must be fully supported in their purchasing decisions. That support must include messaging that is trustworthy, consistent and accurate. An understanding of the social benefits associated with purchasing goods with both high recycled content and efficacy must be established and consistently reinforced.

7. Closing Thoughts

AIEN is working to further the cause of Industrial Ecology and be a catalyst for change to promote the transition to a Circular Economy. Currently the AIEN is investigating the prerequisites for successful change through bringing together key stakeholders with a view to identifying criteria for new Circular Economy initiatives.

All elements of the supply chains will be required to act in concert if a circular economy is to emerge within an Australian context. This will not occur without:

1. Insightful regulatory supervision and coordination. It will be necessary for the required outcomes of the regulatory regimes to be agreed by all stakeholders and clearly communicated.
2. Transitioning from a supply push to a market pull resource management model.
3. Recognising the importance of concepts such as HNRV in directing the optimum allocation of capital resources and minimising risks associated with capital becoming stranded.

The ambition of NSW's renewed 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.
- Recognise the distinction between separation/segregation (the recovery of a specific material stream), processing of the material stream and reuse/manufacturing (productive reutilisation of the recyclate (as a raw material)).

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 must ensure the appropriate participants (including the brands) are marshalled at the highest level.

The AIEN believes Government policy must be directed to all key participant groups in order to realise the circular economy we seek. The AIEN implores the NSW Government to address some of the key elements of the critical processing and manufacturing infrastructure requirements required, and the proactive promotion of markets and the market development for recycled products as prerequisites for a circular economy.

The Language of the 20-Year Waste and Resource Recovery Strategy - 2020 Issues Paper

Examination of the *Cleaning Up our Act: The Future for Waste and Resource Recovery in NSW Issues Paper* and a subsequent word count of the document reveals:

- The word 'waste' or 'wastes' appears on 723 occasions.
- The phrase 'resource recovery' appears on 82 occasions.
- The phrase 'circular economy' appears on 34 occasions.
- The word 'landfill' appears on 49 occasions.
- The words 'innovation' or 'innovate' appears on only 21 occasions.
- The word 'technology' appears on 10 occasions.

The AIEN considers the choice of language provides insight into the motivation and reasoning behind document authorship. The AIEN requests the NSW Government to reflect upon the above statistics in relation to future publications. Inspiring other stakeholders to adopt desired behaviours requires adoption of communication language that is likely to impart such inspiration.

AUSTRALIAN INDUSTRIAL
ECOLOGY NETWORK

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23 September 2019

The Hon. Matt Kean MP
Minister for Energy and Environment
GPO Box 5341
SYDNEY NSW 2001
Email: 20yws@dpie.nsw.gov.au

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.

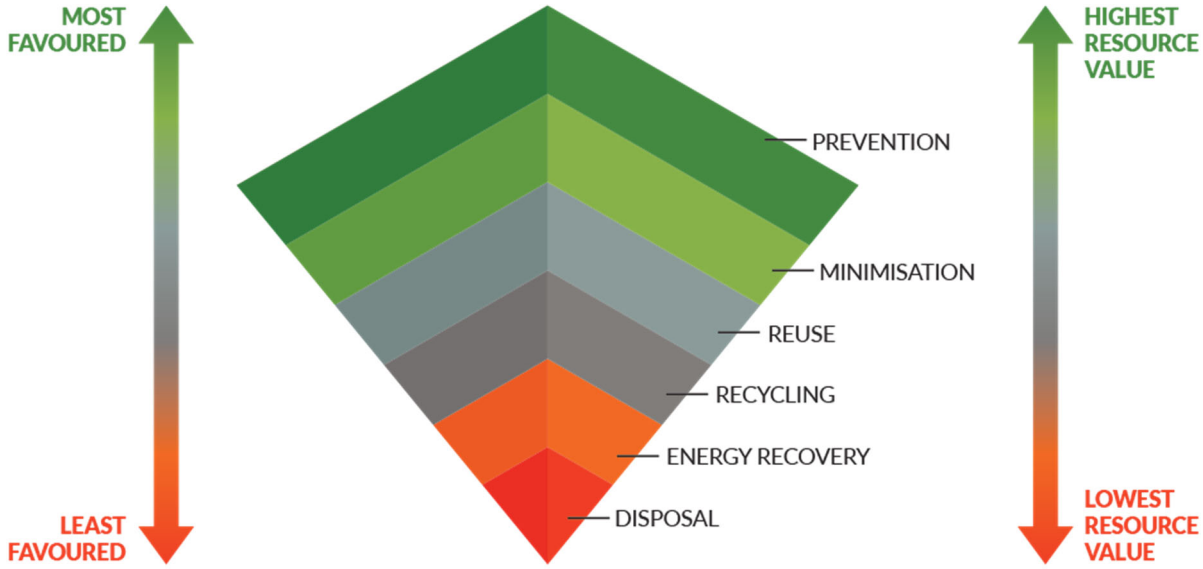
Consultation with the MRF operators would reveal a significant number of like issues across all components of the waste stream. We simply need to be smarter in order to give ourselves a chance of developing a circular economy, free from unnecessary and limiting impediments.

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
Chairman
Australian Industrial Ecology Network