AUSTRALIAN INDUSTRIAL
ECOLOGY NETWORK

AIEN

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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.

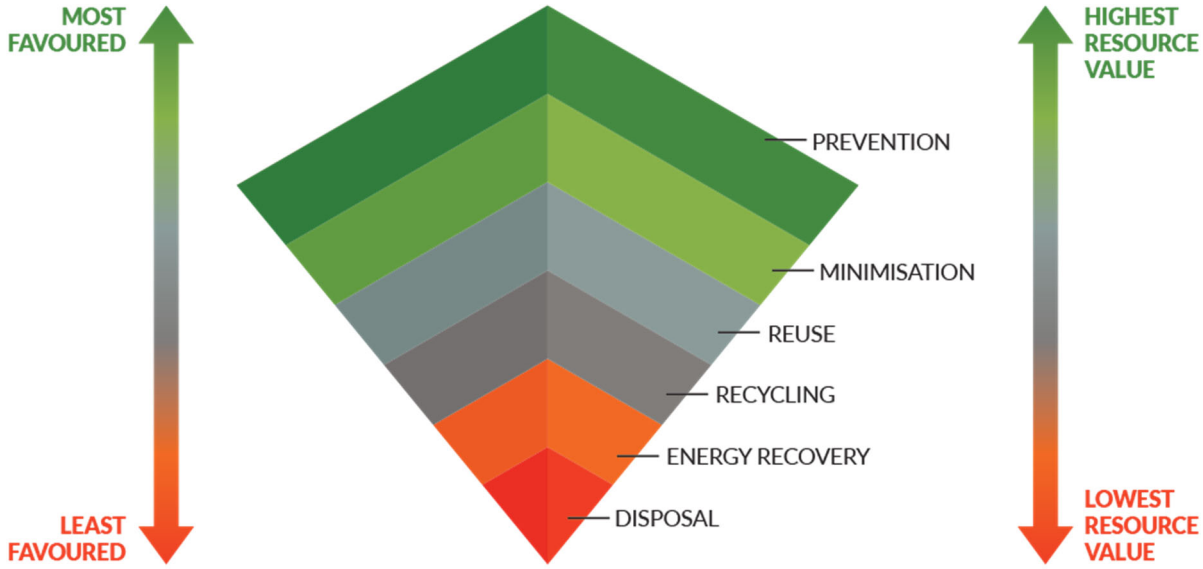
Consultation with the MRF operators would reveal a significant number of like issues across all components of the waste stream. We simply need to be smarter in order to give ourselves a chance of developing a circular economy, free from unnecessary and limiting impediments.

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