China National Sword: The role of Federal Government

A discussion paper prepared for the Australian Council of Recycling (ACOR)

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1 Introduction to China’s National Sword policy

Since 1980, China had been the world’s largest importer of recycled paper and plastics. Between 1995 and 2016 Chinese imports of recyclables grew tenfold, from 4.5m to 45m tonnes, and since 2007 recyclables have been one of China’s largest import categories.

In April 2011, China adopted regulations (known as Article 12) aiming to reduce contamination in imported material: “In the process of importing solid waste, measures shall be taken to prevent it [imports] from spread[ing] seepage and leakage or other measures to prevent pollution of [the] environment.”

In February 2013, the Chinese government decided to aggressively enforce Article 12 to improve the quality of the imported recyclables through ‘Operation Green Fence’.

In February 2017, ‘National Sword 2017’, a 1-year campaign similar to Green Fence, was launched. On 18 July 2017, China announced the ban of 24 import materials to the World Trade Organisation (WTO). On 27 July 2017 China announced its intention to “phase out imports of solid waste (recyclables) that can be substituted by domestic resources” by the end of 2019.

In November 2017, additional filings to the WTO introduced contamination thresholds with an entry into force proposed for 1 March 2018. On 11 January 2018, China confirmed the contamination standards and the ban has since entered into force. The key contamination thresholds include:

- 0.5% for plastics; scrap paper or paperboard; smelt slag; wood; waste electric motors; wires and cables; metal and appliance scrap; ferrous metals.
- 1% for non-ferrous metals.
- 0.3% for automobile scrap.

On 6 March 2018, ‘Blue Sky 2018’, an iteration of National Sword, was announced. The campaign will operate to December 2018 and will enforce the ban announced in 2017.

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2 Effects

2.1 Effect on Australian recycling

Australia exports approximately 60% of its recovered fibre and 20% of its recovered plastic to China. China’s unexpected withdrawal from the trading of recyclables has resulted in an overall collapse in demand and subsequently, lower prices for recovered paper and plastic. While other markets in Asia still show some demand, the oversupply of American, European and Australian materials has meant that prices paid for Australia’s recovered recyclables have crashed (Figure 2).

**Figure 1 Demonstrated international commodity prices for mixed plastic and average fibre**

![Commodity Price Chart]

*Note: ‘Baseline’ refers to historical average prices. The above figure demonstrates the quality issues associated with Australia’s waste data. The above data was obtained from three sources. Sources: MRA estimates based on industry sources in NSW. CIE estimates based on Global Trade Intelligence Data for NSW exports. APCO estimates based on data obtained from Envisage Works.*

2.2 Scale of Australia’s exposure

Australia exports approximately 1.1mt of cardboard annually of which 638,000t/yr goes to China. It exports 160,000t/yr of plastic of which 42,000t/yr goes to China.

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7 Centre for International Economics (CIE), 2018, *Revenue sharing arrangements between MRFs and councils from the NSW Container Deposit Scheme*


10 The Royal Institute of International Affairs, 2018, *Chatham House Resource Trade Database (CHRTD)*, Available at: [www.resourcetrade.earth](http://www.resourcetrade.earth) [Accessed 29 Mar. 2018]
Separately, Australia consumes around 1.25mt of glass packaging per annum\(^{11}\). In NSW alone, 45% of glass processed through Materials Recovery Facilities (MRFs) is converted into sand\(^{12}\). A further 10% is stockpiled interstate as unprocessed glass fines\(^{12}\). Furthermore, a significant but undocumented percentage of the processed glass sand is currently stockpiled and remains unsold. The situation in other states will depend on access to bottling plants and glass beneficiation plants. MRA estimates that the combined tonnages of glass sand and unprocessed glass fines may amount to 300,000t/yr nationally\(^{13}\). Based on figures provided by O-I (the main reprocessor of glass in Australia), approximately 300,000t/year of glass is recycled domestically in Australia and approximately 500,000t/year is neither exported nor reprocessed domestically.

**Figure 2** Australian exports of affected fibre and plastic to China

<table>
<thead>
<tr>
<th>Year</th>
<th>Paper to China</th>
<th>Plastic to China</th>
<th>Paper to rest of world</th>
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Source: Fibre (codes: HS 47071, 47072, 47073) from International Trade Centre (ITC) at [www.trademap.org](http://www.trademap.org) and plastic (code: HS 3915) from Chatham House/The Royal Institute of International Affairs at [www.resourcetrade.earth](http://www.resourcetrade.earth).

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\(^{12}\) Centre for International Economics (CIE), 2017, *NSW Glass Report: Issues and options*, prepared for the NSW Environment Protection Authority

\(^{13}\) Glass sand and unprocessed glass fines comprise 55% of MRF glass in NSW (glass sand comprises 45% of MRF glass and unprocessed glass fines comprise 10% of MRF glass. Source: Footnote 12). The total tonnes of MRF glass in Australia (537,500 tpa) was estimated by multiplying the % of glass packaging recycled nationally (43%) by the amount of glass packing generated nationally (1.25mt) (source: see Footnote 11). Assuming the national glass profile is similar to that of NSW, the national figure for glass sand and unprocessed glass fines (295,625 tpa) was estimated by multiplying the NSW rate (55%) by the total MRF glass in Australia (537,500 tpa).
Australian households recycle approximately 2.4mt/yr through their yellow top recycling bins. In NSW, the major streams (by weight) are paper (50% of input tonnage to a MRF), glass (30%), plastic (7%), ferrous metals (2%) and aluminium (1%); the remainder of the bin (10%) is contamination.

The Waste Management Association of Australia (WMAA), estimates that China National Sword 2017 affects an annual average of 619,000t of materials generated in Australia, worth $523m (Appendix A).

MRFs vary in design and thus recover materials to different levels of detail. Some MRFs recover materials into the basic material categories: mixed fibre (paper and cardboard); mixed glass, mixed plastic, steel and aluminium. Other MRFs sort plastic into 3 component streams (HDPE, PET and mixed plastic). And yet others sort materials down further into: 4 paper streams (cardboard, newsprint, mixed paper, liquid paper board), 4 glass streams (clear, green, amber and fines), 3 plastic streams (PET, HDPE and mixed plastic), steel and aluminium. These will be referred to as ‘13-sort MRFs’ in this report.

13-sort MRFs are somewhat less exposed to National Sword since they sort plastics and paper down to their component streams. The prices for PET and HDPE have not declined to the extent of mixed streams, to date. Similarly, sorted cardboard has a higher domestic demand compared to mixed paper. Consequently, Australian MRF markets for sorted cardboard (OCC) remain robust.

MRFs earn most of their revenue through the sale of recyclable paper (50% of input tonnage) and plastic product (7%) as well as metals (3%), the three most valuable commodities produced by MRFs. The fall in commodity prices has put many MRF operators into financial risk.

In the immediate term, all have to secure higher front gate revenue (the gate fee paid by Councils) or go into liquidation.

MRF operators (private and public) generally enter into long term (7-10 year) contracts for the management of recyclables, with fixed prices based on the conditions and market outlook at the time of tender. Most of these contracts do not include a ‘Mark to Market’ clause. Approximately half have a ‘Change in Law’ clause. It remains a matter of debate as to whether WTO rules constitute a change in law as far as Australian contract law is concerned.

In addition, the recycling industry fears that having to landfill recyclables would greatly damage the public’s trust in kerbside recycling systems. Australia’s globally leading recycling systems have been developed through long term investment in education and training.

MRA estimates that China’s National Sword policy has resulted in a direct loss of $70-110/input tonne for MRFs, not including the price fall in glass. This figure sits within the range of other published estimates (Figure 3).

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16 ABC News, 2017, China’s ban on foreign waste leaves Australian recycling industry eyeing opportunities, Available at: http://www.abc.net.au/news/2017-12-10/china-ban-on-foreign-rubbish-leaves-recycling-industry-in-a-mess/9243184 [Accessed 29 Mar. 2018]
Figure 3 Comparison of published lower bound and upper bound gate fee increase estimates

Source: MRA estimates based on industry sources from NSW. CIE estimates based on information provided to CIE by NSW MRFs\textsuperscript{7}. APCO estimates are national and based on information obtained from Envisage Works\textsuperscript{8}.

2.3 Short term remedies

2.3.1 State government response

The NSW government announced a $47.25m ‘support package’ for local government and industry on the 19\textsuperscript{th} March 2018. The package will support councils in off-setting potential gate fee increases, community education around contamination and grants for capital outlay on secondary reprocessing infrastructure\textsuperscript{17}.

The Victorian government announced a leaner package of $13m in February 2018 to support councils in offsetting gate fee increases or other interim cost associated with the impact of China’s actions until July 2018\textsuperscript{18}.

The South Australian government has announced that $300,000 in grant funding will be made available and administered through Green Industries SA to fund the development of secondary reprocessing infrastructure\textsuperscript{19}.


2.3.2 Local government responses

Several Victorian Councils (Horsham and Moyne) have begun stockpiling recyclables in the hope that China "changes its mind". Others have acknowledged that Councils will be forced to explore putting recycling into landfill\(^{20}\).

In WA, there is an expectation that, because of the ban, household waste charges will increase, and Perth’s low recycling rates will decrease further\(^{21}\).

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3 Strategic medium-term response – the ACOR proposal

ACOR believes that China National Sword offers a once in a generation opportunity to “reset” Australia’s recycling systems to achieve improved resource efficiency and enhanced economic outcomes.

ACOR has summarised its approach under three key focus areas: investment, improvement and innovation. The following sections summarise ACOR’s approach.

3.1 Investment

Australia, like all other western countries, needs to re-examine its dependence upon China for recyclables processing, secondary reprocessing and manufacturing into new products. The key question is: where along the supply chain should one intervene, and to what extent, to reinforce the market and to minimise future risk?

Australia has benefited hugely by exporting its recyclates (plastic and fibre) to Asian markets with economies of scale and vibrant manufacturing sectors capable and eager to absorb the recovered materials.

To minimise risk, it is clear that Australia needs to invest in MRF improvements and some secondary reprocessing (of some material streams). But that’s not the end of the story. The risk of secondary reprocessing failing to compete with overseas markets must also be managed.

3.1.1 MRF investment

Better source separation and enhanced MRF performance will reduce the contamination rate (and improve the quality) of exported materials.

Australia’s kerbside recycling arrangements have arisen as a series of relatively independent commercial arrangements between councils and MRFs, MRFs and re-processors and international consumers. Overall, Australia’s recycling industry has not received the degree of national coordination granted to other basic services and utilities (such as energy). There has also been no systematisation or harmonisation of these disparate components. Guidelines that do exist, exist sporadically at the state level around bin systems and contamination education. China National Sword offers a unique opportunity to harmonise and systematise Australia’s resource recovery sector, starting with kerbside recycling systems. It is also true that almost a third of Australia’s eligible household recyclate still goes to landfill via the red bin. These lost resources (and the lost value to Australia’s economy) constitute one of the potential gains from a more coordinated waste management system, while a substantial reduction in contamination and improved output quality are two others.

Australia recycles approximately 2.4Mt/yr through its MRF infrastructure. There are over 100 MRFs operating in Australia, with 10 major providers and at least 30 smaller providers. The range in size is considerable, from 15,000t/yr to 260,000t/yr.

One immediate response to China National Sword has been a reappraisal of the potential for source separated glass and/or paper collection systems. Five councils in NSW currently have a separate paper collection service. As far as MRA is aware, there are no segregated glass collection systems in domestic kerbside programs, although there are reports that some Councils are now considering such a system. Consideration of segregated glass and/or paper systems, to improve MRF efficiency and the quality of outputs, must be part of any MRF improvement or capital investment program. O-I estimates that, with improved quality, an additional 150,000t/year of glass could be recycled (although this assumes that
transport costs to reprocessing facilities will also become more viable). MRA recommends a scoping study and trial to evaluate the cost benefit of segregated collection systems for fibre to fibre and bottle to bottle recovery. The emergence of CDS nationally makes this study an imperative. **MRA estimates the scoping study and trial will cost $2m.**

To reduce export contamination, MRF operators will need to:

1. Install additional screens and bounce conveyors to remove small items.
2. Install enhanced optical sorting equipment to detect and remove contaminants in fibre and plastic streams.
3. Employ additional workers as manual sorters on each of the major lines to reduce contamination.
4. Slow down the processing speed (at the MRF’s expense).

The average MRF input contamination rate in Australia is 8-10% (ranging as high as 30%). The issues of community education around contamination reduction will be discussed in a later section on community engagement. However, a reduction in kerbside contamination rates can substantially reduce MRF costs (contamination is processed and then landfilled) and result in higher quality export commodities. MRA estimates that to achieve significant improvements in the quality of MRF outputs, and to approach the new contamination thresholds set by China, it would cost approximately $300/t in additional capital, optical sorters, landfill disposal and manual handling (subject to economies of scale).

**Improving the quality of 100,000t of MRF product would cost approximately $31m (once off). Private investment could be leveraged to potentially double the tonnage. Together with the scoping study and trial for source separated glass systems, the proposed MRF investment totals $33m.**

### 3.1.2 Fibre secondary reprocessing

Most fibre reprocessing in Australia occurs in the major paper mills owned by VISY, Orora and Norske Skog. VISY and Orora export approximately half of their fibre receipts annually. Australia’s total exports of fibre in 2016 was 1.1mt. Of that, 638,000t was exported to China.

Existing on-shore recovered fibre processing is estimated at 1.1mt. Norske Skog produces almost 80% of Australia’s newsprint, while their Albury Mill supplies 40% of Australia’s newsprint consumption. It is not a major exporter of fibre. A limited number of smaller fibre reprocessors have also indicated a willingness to receive and reprocess Australia’s excess recycled fibre (e.g. Lakeside Packaging).

The paper industry is highly capital intensive. Therefore ‘on-shoring’ of additional fibre processing capacity may be relatively expensive (compared to plastic and glass). According to the International Energy Agency:

> “A large-scale pulp mill with an annual pulp production of around 1.4 million tons costs about USD$2.5 billion if built from the ground up. The specific investment costs are around $1,500-2,000 per ton of capacity.”

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22 Information obtained directly from O-I in April 2018.

23 MRA estimate based on industry experience in feasibility studies and cost benefit analyses for recycling infrastructure projects.
USD/ton/yr. As for many capital-intensive industries, economies of scale apply, giving lower specific investment costs for larger mills.\(^{24}\)

To put this in context, the 2006 upgrade to the Albury Mill cost $135m to process 275,000t/yr of which 98,000t was recovered as paper (or 33%).

It is yet unclear if the major fibre reprocessors will naturally expand their activities in response to the fall in fibre prices (which is an input cost to their businesses).

It is likely that, if government were to intervene in the paper reprocessing market, it would be more cost effective to upscale existing mills than to build new facilities.

Further detailed advice would be required from the relevant companies to determine the extent to which they could absorb additional fibre into their current systems.

MRA estimates that the upgrade cost for fibre would be approximately $300/t in expanded pulping capacity, landfill disposal and manual handling (subject to economies of scale).

\[
\text{At } $300/t, \text{ a capital contribution from government of } $30m \text{ would achieve the direct diversion of 100,000t/year, or 200,000t/yr with a 50% co-contribution from the private sector.}
\]

Please note, a greater capital contribution from government would be required to support the creation of secondary markets for all fibre tonnes (640,000t/yr) currently exported to China.

3.1.3 Plastic secondary reprocessing

There are significant opportunities to recover and reprocess plastic domestically. VISY already operate a HDPE (milk bottle) recycling facility in Sydney, returning recyclates back to the productive economy. The $50m plastic plant recycles some 40,000t of plastic bottles (2 billion bottles at an average weight of 20g/bottle).

Plastic reprocessing facilities that wash, flake and pelletise waste plastic are relatively affordable and can be co-located with MRFs or established as stand-alone facilities. The resulting plastic flakes or pellets can be sold into the domestic or international markets. The markets for flake and pellets have retained their price level despite National Sword.

The average cost of a plastic wash, flake and pelleting plant is $4-$7m for a 21,000t/yr capacity facility, depending on the extent of washing and type of on-site water treatment\(^{25}\).

\[
\text{To meet the 40,000t exported to China, Australia would need to build 2 facilities or invest $8-14m. At a 50% co-contribution, government support to process the 40,000t of Australia’s plastic export to China is estimated at $4-7m.}
\]


\(^{25}\) These figures were obtained from an Australia supplier of plant and equipment.
3.1.4 Glass reprocessing

The other major impact on MRF economics, and therefore viability, has been the overall collapse in glass demand in Australia. While glass represents approximately 30-35% by weight of material entering a MRF, the demand for glass cullet in Australia has declined substantially in the last decade. This has resulted in the closure of a number of glass reprocessing facilities and more recently the stockpiling (and some minor landfilling) of large quantities of glass cullet, particularly glass fines.

Owens-Illinois (O-I, the main reprocessor in Australia) purchases glass directly from merchants and MRFs. O-I can achieve up to 39%\textsuperscript{26} recycled glass content in new bottles that it manufactures\textsuperscript{26}. With light-weighting of bottles and mechanised collection, up to 50% of glass is broken by the time it reaches the MRF processing line. These glass “fines” are more difficult and costly to reprocess into new glass products. Being a globally traded commodity, the economics of glass recovery are also subject to market movement. O-I has closed two furnaces in Sydney due to an increase in glass imports\textsuperscript{12}, additional competition in the domestic glass market (from Orora) and a decline in the beer market in the last 5 years (which has now stabilised)\textsuperscript{22}. Benedict Industries operated a 150,000t glass sand plant but unfortunately closed in 2015 due to contractual disputes around asbestos contamination\textsuperscript{12}.

Bottle-to-bottle, over several decades, has recovered millions of tonnes back to the productive economy in Australia.

As bottle making has declined as an end-of-life outcome for glass bottles, crushing them into sand for inclusion in road base, asphalt and concrete has expanded. Several processors, such as EnviroSand, Lismore City Council and PAR Recycling now crush glass cullet to make sand replacement.

The technology for washing and crushing glass is well known. The costs range from $5.9-$7.9m for a plant capable of reprocessing 60,000t/year, depending on the quality of the infeed material\textsuperscript{27}.

\begin{quote}
At $130/t the estimated cost of increasing glass reprocessing by 300,000t/year is $20m, with matched funding from relevant commercial service providers.
\end{quote}

3.2 Improvement

3.2.1 Standardised contractual model

One impact of National Sword has been the increase in commercial disputes between Councils and MRF operators. Faced with few alternatives besides increasing Council rates, MRF operators have increasingly had to rely on contractual terms to achieve commercial redress for the loss of commodity value.

NSW and several other states have published model contracts for the establishment of the commercial relationship between Council and the MRF operator. However, these are neither consistent nor uniformly applied by councils.

\textsuperscript{26} Owens-Illinois (O-I), 2017, Submission to the enquiry into the waste and recycling industry in Australia, prepared for the Senate Standing Committee on Environment and Communications

\textsuperscript{27} Refers to the Brisbane Cullet facility, established by O-I with support from the Australian Packaging Covenant. Information obtained directly from O-I in April 2018.
A consistent approach to contracting MRF processing services (including risk management, commodity rise and fall etc.) would be a significant improvement to current arrangements.

**The cost of developing and rolling out a broadly adopted model contract is $1m.**

### 3.2.2 National kerbside auditing and monitoring

Each state has its own protocols for the auditing of contamination in kerbside recycling. There is no national database of contamination rates of kerbside recycling. Some states publish average kerbside contamination rate data sporadically.

The Australian Bureau of Statistics is the appropriate body to develop, audit and publish a national kerbside database including contamination rates, trends and costs.

**The cost to develop a national kerbside auditing protocol is estimated at $1m (once off), as several exist.**

### 3.2.3 National waste database

Australian waste data is shambolic at best. Currently the Federal Government engages a consultant to pull together voluntarily provided data from the states. The most recent report in 2016 used data from 2014/15 and 2012/13, as provided by each state. It also had notable gaps in information.

The waste industry employs over 50,000 people nationally and is valued at over $15b/year. The investment horizon is worth over $1 billion per year. Investors regularly criticise the lack of accurate, reliable and verifiable data in the Australian waste and recycling sector.

The Australian Bureau of Statistics is the appropriate body to develop, audit and publish a national waste database, including waste growth rates, recycling rates, investment data, industry trends etc.

Most states now have mandatory reporting for facilities operating in their waste and recycling sector. However, not all. That needs to be remedied via a requirement for weighbridges and mandatory reporting, across all states.

**The cost to develop and manage a National Waste Database is estimated at $10m (once off). This does not include physical infrastructure such as weighbridges, which would count as operating costs.**

### 3.2.4 Guidelines for harmonisation of collection systems and materials

There is no common set of guidelines for the recycling of materials between, or within, states. For example, coffee cups are fully recyclable through some MRFs but are not accepted in most. Some accept film plastic (e.g. plastic bags), but most do not.

Most councils now accept a 240-litre yellow lidded bin as the standard for kerbside recycling, with the adoption of a 360-litre bin an increasingly common alternative. However, some councils still use a black lidded bin or crate. A few councils collect paper separately from commingled containers, arguing it results in lower contamination rates in the fibre stream.
The adoption of a national standard for materials accepted in kerbside recycling, and the type and nature of the bin systems used, would demystify the kerbside recycling system for the public and result in improved outcomes.

Some standardisation has already occurred within states via the adoption of ‘Best Bin Systems’. These are welcomed and should be rolled up into a national guideline.

The cost of developing a national guideline for acceptable materials and a best bin system is estimated at $1m (once off).

### 3.2.5 National contamination communications campaign

China National Sword offers an opportunity after 20 years of ad hoc education to reengage with the public around a national campaign to reduce contamination in yellow top bins. As stated previously, the average contamination rate in kerbside recycling bins in Australia is 8% nationally, although this varies widely across states and geographies. Contamination rates of 30% are not unheard of. Public place recycling bins suffer the highest rates of contamination and are regularly at the 30% level.

Reducing contamination rates would have an immediate effect on MRF profitability since all contamination must be landfilled at a cost. Australia currently processes approximately 2.4mt/yr through MRFs. At an average 8% contamination rate, the costs to the sector are an estimated $19m/yr (assuming an average disposal cost of $100/t of contaminants). That cost could be easily reduced with a targeted campaign to reduce recycling bin contamination rates.

The cost of a national kerbside recycling bin contamination campaign is estimated at $10m (once off).

### 3.2.6 Circular Economy Council

The Australian Council of Recycling (ACOR) and the Waste Management Association of Australia (WMAA) have called upon governments to develop an Australian Circular Economy and Recycling Action Plan.

Circular economy is more than a catch phrase. It requires a fundamental reengineering of our economy to one which internalises externality costs, which prices materials recycling equally with virgin materials extraction and which prioritises reuse and recovery in the design and application of products.

Achieving a circular economy can bring huge economic and social benefits.

The purpose of the Action Plan is to “future focus” the recycling and resource recovery industry as a key component in guiding Australia’s economy towards circularity. The plan would include:

1. $150 million from the Federal Government towards a Recycling Fund (as covered in this document).
2. A Circular Economy Council to ensure policy development consistent with a Circular Economy objective.
3. Expansion of domestic recycling markets to grow domestic jobs and economic growth whilst making Australia less reliant on overseas markets for its recovered recyclates.

The cost of a Circular Economy Council with attendant action plans is estimated at $1m/year for 5 years or $5m (once off).
3.3 Innovation

3.3.1 Positive Procurement

There are a range of existing potential markets for Australia’s recovered recyclates. Fibre can be used in insulation and building products, plastic in asphalt and glass fines as an additive in asphalt and concrete. Glass fines are a valid sand replacement in road base.

The recycling sector has worked for many years with governments to develop standards for the use and preparation of recyclates in these ‘alternative markets’. For example, there are well documented guidelines for the use of glass fines in road-base, asphalt and concrete.

The limiting factor or barrier, is not the science around the use of the materials but inertia around the purchasing of these materials. For example, there are few positive procurement policies at either Federal, State or Local government levels which preference the use of these materials over their virgin equivalents. Without such proactive procurement policies, it is easy for risk minimising bureaucrats to justifiably preference reliable and known virgin materials.

To develop viable domestic secondary markets for fibre, plastic and glass, Australia needs to develop and institutionalise ‘positive procurement’ policies, which include minimum percentage usage, specifications and accreditation certificates.

The cost of developing and implementing a positive procurement regime for glass, fibre and plastic is estimated at $5m/year for 4 years or equivalent to $20m (once off).

3.3.2 National Centre for ‘Recycled Content Products’

While there are existing markets for the above commodity streams there are a range of new applications which potentially offer greater economic return. Australia is an innovation hub for many technologies. However, we have been slow in taking up the innovation opportunities afforded by recycling. A number of Cooperative Research Centres and universities have variously examined applications of recyclates to industrial uses but there has been no concerted effort via a nationally funded centre of excellence.

The key areas for innovation could include:

- Use of RDF from recyclate residual.
- Use of glass in building products, such as brickmaking.
- Fibre in building products.
- Plastic in asphalt (India has an aggressive program of using plastic in asphalt).
- Plastic in building products.

The cost of funding a National Centre for Recycled Content Products is estimated at $2m for 4 years or equivalent to $8m (once off).

3.3.3 ‘Buy Recycled’ Alliance

It is one thing to have governments purchasing recycled content materials via positive procurement policies and another for the broader public to do so.
Australia has had a range of initiatives designed to encourage consumer preference for recycled content goods.

The Buy Recycled Business Alliance (BRBA) was a non-profit alliance of businesses united by a commitment to promote the purchase and use of recycled content products (RCPs) and materials.

The BRBA worked closely with Australian businesses, state and local governments and the community to promote initiatives and public policy frameworks which promote the ‘buy recycled’ concept. Members and sponsors included Amcor, Australian Paper, Corporate Express, Fosters, Fuji Xerox, McDonald’s and Visy Industries. It ceased to operate as a national entity several years ago.

The estimated cost of establishing a “Buy Recycled” business alliance and promoting it widely is estimated at $1m/year for 4 years or equivalent to $4m (once off).
4 Summary

This paper identifies a range of priority actions to respond to China National Sword and the impending crisis in domestic recycling. Table 1 provides a summary of the actions and expected costs.

<table>
<thead>
<tr>
<th>Action</th>
<th>Period of application</th>
<th>Calculated Cost (total) ($m)</th>
<th>Grant funding only (tonnes)</th>
<th>Grant funding with matched contribution (tonnes)</th>
<th>FTE jobs created(^{28}) (direct + indirect)</th>
<th>GHG emissions avoided(^{29}) (t CO(_2)-e)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRF investment (incl. separated glass study + trial)</td>
<td>Once off</td>
<td>$33</td>
<td>100,000</td>
<td>200,000</td>
<td>184 + 37</td>
<td>120,000</td>
</tr>
<tr>
<td>Fibre secondary reprocessing</td>
<td>“”</td>
<td>$30</td>
<td>100,000</td>
<td>200,000</td>
<td>184 + 37</td>
<td>160,000</td>
</tr>
<tr>
<td>Plastic secondary reprocessing</td>
<td>“”</td>
<td>$7</td>
<td>20,000</td>
<td>40,000</td>
<td>37 + 7</td>
<td>40,000</td>
</tr>
<tr>
<td>Glass reprocessing</td>
<td>“”</td>
<td>$20</td>
<td>150,000</td>
<td>300,000</td>
<td>276 + 55</td>
<td>168,000</td>
</tr>
<tr>
<td><strong>SUB TOTAL</strong></td>
<td></td>
<td>$90</td>
<td>370,000</td>
<td>740,000</td>
<td>817</td>
<td>488,000</td>
</tr>
<tr>
<td><strong>Improvement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardised contractual model</td>
<td>“”</td>
<td>$1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>National kerbside auditing and monitoring</td>
<td>“”</td>
<td>$1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>National waste database</td>
<td>“”</td>
<td>$10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Guidelines for harmonisation</td>
<td>“”</td>
<td>$1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>National contamination communications campaign</td>
<td>“”</td>
<td>$10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Circular Economy Council</td>
<td>Over 5 years</td>
<td>$5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>SUB TOTAL</strong></td>
<td></td>
<td>$28</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

\(^{28}\) Based on grant funding with matched contribution tonnes. 9.2 direct FTE jobs per 10,000 tonnes of waste recycled and 1.84 indirect FTE per 10,000 tonnes. (Source: Access Economics, 2009, *Employment in waste management and recycling*, prepared for the Department of the Environment, Water, Heritage and the Arts). NB: While ‘MRF investment’ does not involve ‘new’ tonnes, it does include increases in manual labour and the purchase and operation of additional machinery.

\(^{29}\) Calculated using the NSW EPA’s Recyculator Tool.
<table>
<thead>
<tr>
<th>Action</th>
<th>Period of application</th>
<th>Calculated Cost (total) ($m)</th>
<th>Grant funding only (tonnes)</th>
<th>Grant funding with matched contribution (tonnes)</th>
<th>FTE jobs created (direct + indirect)</th>
<th>GHG emissions avoided (t CO₂-e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Procurement</td>
<td>Over 4 years</td>
<td>$20</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>National Centre for “Recycled Content Products”</td>
<td>Over 4 years</td>
<td>$8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>“Buy Recycled” Alliance</td>
<td>Over 4 years</td>
<td>$4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td><strong>$32</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$150</strong></td>
<td><strong>370,000</strong></td>
<td><strong>740,000</strong></td>
<td><strong>817</strong></td>
<td><strong>488,000</strong></td>
<td><strong>-</strong></td>
</tr>
</tbody>
</table>
Appendix A  Banned materials generated in Australia and exported

Table 2 summarises the available information on the quantity and export value of the banned materials generated in Australia in recent years.

Table 2 Schedule of banned materials and estimated export tonnes and value

<table>
<thead>
<tr>
<th>Banned classes</th>
<th>Banned types</th>
<th>Quantity generated in Australia 2014/15</th>
<th>Quantity exported from Australia 2011/12</th>
<th>Value of exported material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic waste from living sources (English translation: postconsumer plastic scrap (waste, parings and scrap of plastics))</td>
<td>Ethylene polymer (PE, polyethylene) scrap and waste</td>
<td>2.5m tonnes of plastic waste</td>
<td>45,000t of waste plastic exported to China (39% of total exported)</td>
<td>$16m (exported to China)</td>
</tr>
<tr>
<td></td>
<td>Styrene polymer (PS, polystyrene) scrap and waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vinyl chloride polymer (PVC) scrap and waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Polyethylene terephthalate (PET, a form of polyester)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other related waste/scrap plastics/polymers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not elsewhere classified (Post-industrial recycled plastics 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not elsewhere classified (Post-industrial recycled plastics 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not elsewhere classified (Post-industrial recycled plastics 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsorted scrap paper</td>
<td>Other recovered paper or paperboard, including unsorted waste and scrap</td>
<td>5.3m tonnes of paper &amp; cardboard</td>
<td>440,000t waste &amp; scrap paper, paperboard or cardboard exported to China (10% of total exported)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Used or scrap textile materials</td>
<td>Waste wool or fine or coarse animal hair, including yarn waste, excluding garnetted stock</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td>Cotton waste (including yarn waste and garnetted stock)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Garnetted stock of wool or fine or coarse animal hair</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Waste (including noils, yarn waste and garnetted stock) of synthetic fibres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Used or new rags, scrap twine, cordage, rope and cables and worn out articles of twin, cordage, rope or cables, of textile materials</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Banned classes</td>
<td>Banned types</td>
<td>Quantity generated in Australia 2014/15</td>
<td>Quantity exported from Australia 2011/12</td>
<td>Value of exported material</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>----------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Metal slag containing vanadium</td>
<td>Other scum and slag with vanadium produced by smelting the steel (other than granulated slag produced by smelting the steel)</td>
<td>5.2m tonnes of metal waste, 11m tonnes of fly ash waste</td>
<td>3.6m tonnes waste metals (waste and scrap of cast iron, ferrous metals, gold, copper and aluminium) (82% of total exported)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Metal slag containing vanadium</td>
<td>Slag, ash and residues, containing by weight more than 10% but not exceeding 20% of V2O5 (other than from the manufacture of iron or steel)</td>
<td>592,000t waste metal exported to China (31% of total exported)</td>
<td>$602m (exported to China)</td>
<td>Unknown</td>
</tr>
<tr>
<td>Metal slag containing vanadium</td>
<td>Slag, ash and residues, containing by weight more than 20% of V2O5 (other than from the manufacture of iron or steel)</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

TOTAL WASTE EXPORTED: 4.4m tonnes  
(China received 32% of Australia’s total waste export)  
$2.4m

References:
http://www.abs.gov.au/ausstats/abs@.nsf/Products/4602.0.55.005-2013~Main+Features~Australia%27s+International+Trade+in+Waste
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