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## Recycling 2.0 - recovered paper market crisis offers opportunities

*IndustryEdge prepared this analysis in conjunction with Steve Balmforth\*.*

Australia's world's best practice paper and paperboard recovery and recycling performance and program is at a crossroads.

Fuelled by rampant demand for raw materials in China, Australia and other developed countries stepped up to the plate and delivered literally millions of tonnes of recovered materials to China.

For Australia, paper and paperboard, much of it collected from Australian households, has been the giant volume that fuelled all other collections. Exports of recovered paperboard (Old Corrugated Containers or OCC) in particular, were joined with very large domestic processing volumes (primarily to manufacture recycled corrugated boxes) to see Australia's recovery rates jump from below 50% to a world leading 76% in 2016.

A new ban on material imports to China has massively disrupted that supply-chain and market. So much so that commencing in Victoria (the largest exporting state), regional Councils were advised in early January by the major collectors, they would no longer be taking their recycled materials, invoking force majeure provisions in the process.

The rationale for the major collectors is simple and compelling. There is little point in collecting massive volumes of material if all that happens is the collectors lose money.

At the time of writing, the Victorian government had announced an AUD13 million package to support ongoing kerbside collection for the next four months and will establish a Taskforce to address the issues.

The crisis is under active consideration in other states across Australia. Industry stakeholders and governments at all levels are involved, and a solution is being sought that will continue to see household recycling bins be collected and the materials recycled in the short term.

In this detailed examination, we explore how this situation arose, how serious it could be, and what can be done to address it now and into the longer term.

### What is the current situation?

In the middle of 2017, the Chinese government announced its 'National Sword' policy, which would, from the start of 2018, ban imports of a long list of lower quality materials, especially recycled materials. As *Pulp & Paper Edge* readers know, this included 'Unsorted' or mixed/other recovered paper and 'contaminated' Unbleached Kraft or OCC.

For countries like Australia, the US and within the European Union, this represents a major challenge. China has been the vast resources soak the world required to rid it of its low value materials. We can see this in the chart on the next page, which displays the proportion of Australia's exports of recovered paper, by grade.

In 2017, Australia exported 1,473,962 tonnes of recovered paper, of which 61.0% was Unbleached Kraft and 23.9% was the largely Unsorted grade.

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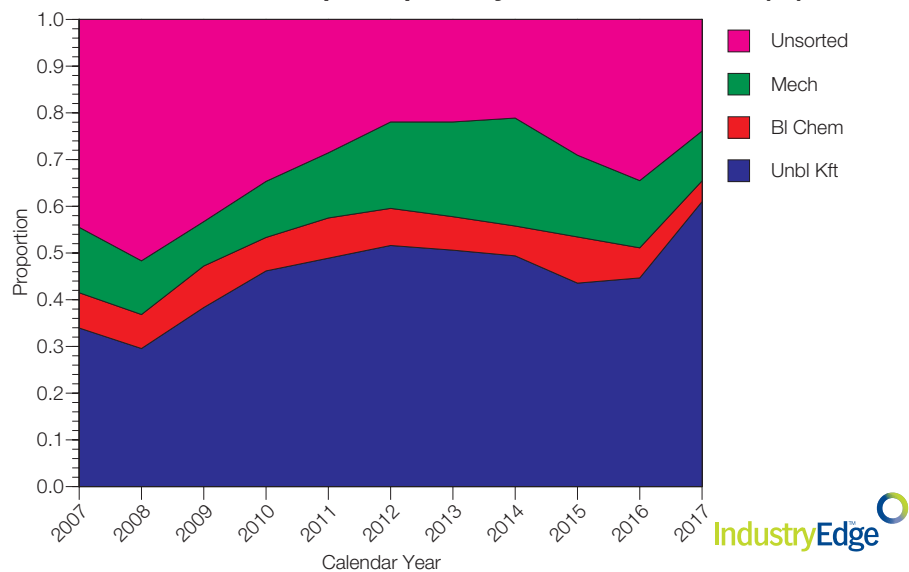
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The reality of the world's paper recovery supply chain is that it has long been set to full steam ahead for destination China. For Australia in 2017, that amounted to more than three-quarters of a million tonnes of recovered paper.

But China isn't open any longer, at least not for the contaminated material that represents a large portion of modern supply.

### Australian Recovered Paper Exports by Grade: 2007 – 2017 (%)



Source: ABS

# **Unbleached Kraft** or **OCC** is primarily corrugated cartons and other packaging and industrial papers, **Bleached Chemical** is primarily office and commercial paper, manufactured with chemical pulp, **Mechanical** is largely Old Newsprint (ONP) and catalogue and magazine grade paper manufactured from mechanical pulp and **Unsorted** is mixed or other recovered paper, including most of the collections from kerbsides.

As the dominant purchaser of recyclables, China has controlled the market and from time to time in the past has, at short notice, reduced volumes based on pricing, demand and quality considerations. During these not infrequent periods, the export market has been 'caught short'. Few lessons appear to have been learned, with little done until recently to address mounting quality concerns.

Prices during these 'adjustment' periods dropped dramatically, and although export profit margins dropped accordingly, processors and exporters mostly rode out the storm, as the pricing cycle changes were almost predictable over a three to four year period.

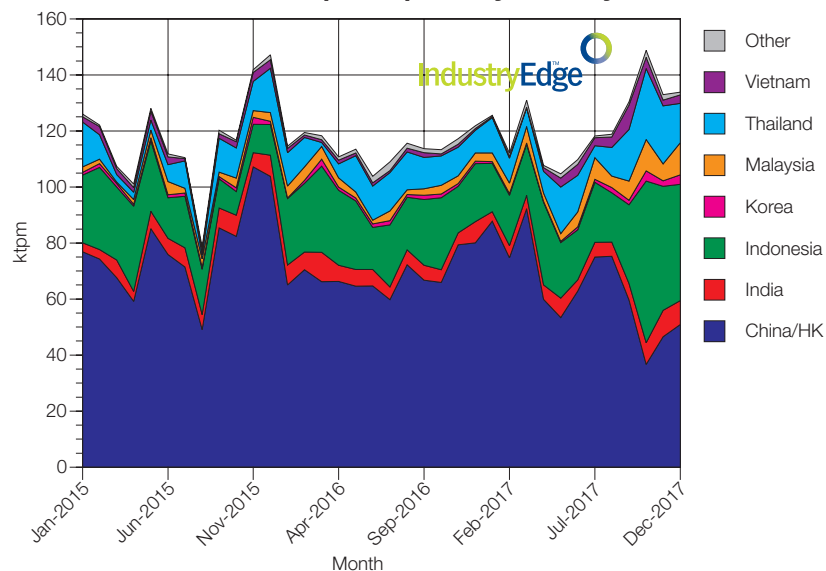
However, as may be expected, as living standards in China rise, the environmental impact of this phase of development has become too great. Coupled with that inevitable development, China now collects more of its own materials for recycling, and some recycled commodity prices (for plastics for instance) have fallen.

The import ban essentially says to the world that China will no longer receive rubbish from its supplier counterparts.

### How big is the crisis for Australia?

Since peaking in 2012 at 1,191,220 tonnes, Australia's recovered paper exports to China/Hong Kong have declined to total 775,597 tonnes in 2017. Australia's total RCP exports were just 5.3% lower in 2017 compared to 2012, meaning, as the chart below shows, that other countries have begun to step in to take China's place as users of Australia's RCP.

### Australian Recovered Paper Exports by Country of Destination: Jan '15 – Dec '17 (ktpm)



Source: ABS

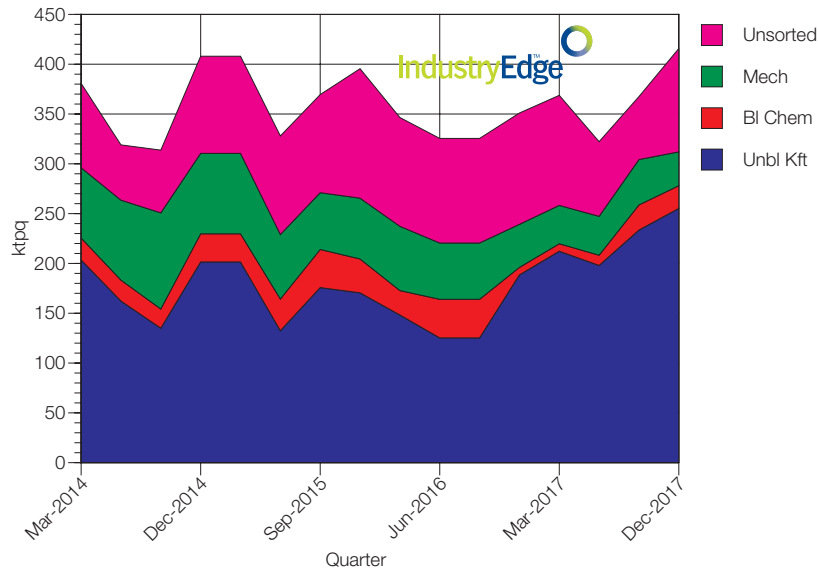
Most notably, Indonesia and Thailand have been receiving growing volumes of Australia's recovered paper, as their economies enter a period of growth that makes their appetite for recycled materials ever more voracious.

But we should not be fooled by growing exports to countries other than China. Each has their own markets and situations and they are no mere facsimile of China's situation. As the chart shows, their position can be built upon, but only gradually. We do not need to point out that at some point, they too will cease to be willing recipients of any less than the highest quality material.

## What is Australia's recent export experience?

To place this situation into context, it is important to examine the recent data. Australia's exports of recovered paper, by grade, are displayed in the chart below, on a quarterly basis since MQ'14.

**Australian Recovered Paper Exports by Grade: MQ'14 – DQ'17 (ktpq)**

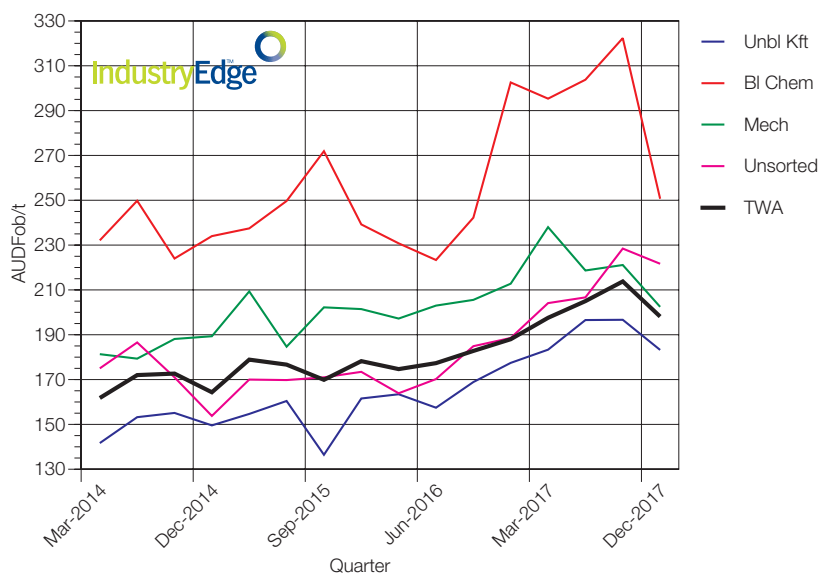


Source: ABS

In DQ'17 RCP exports totalled a very strong 415,583 tonnes, dominated by 255,158 tonnes of Unbleached Kraft or Old Corrugated Containers (OCC). This was the highest quarterly volume across the period displayed in the chart. As a result, full year exports came close to the top of their range, at the 1,473,962 tonnes outlined earlier.

To date, price has barely been impacted by the crisis, with the average prices – especially of the dominating OCC grade – still toward the top of their recent range, as the chart below shows. However, a note of caution is required on the pricing data. It shows the price paid at the point of export and is not adjusted for any volume that may be rejected, or any price negotiations for material where the RCP is contaminated, but is still accepted.

**Australian Recovered Paper Exports by Grade: MQ'14 – DQ'17 (AUDFob/t)**



Source: ABS

For the record, in DQ'17, the average Unbleached Kraft or OCC price was AUDFob183.14/t, 3.2% higher than in the DQ'16. For other price information, see the monthly Recovered Paper Market Briefing in this edition of *Pulp & Paper Edge*.

## Recovery sector a victim of its own success

For many years, collections of recyclable materials were conducted on a wholly separated basis. The Scouts liberated source-separated Newspapers and Magazines, the 'bottle-o' collected the long necks from along the side fence and kids sold aluminium cans to the bloke in the car park at the supermarket.

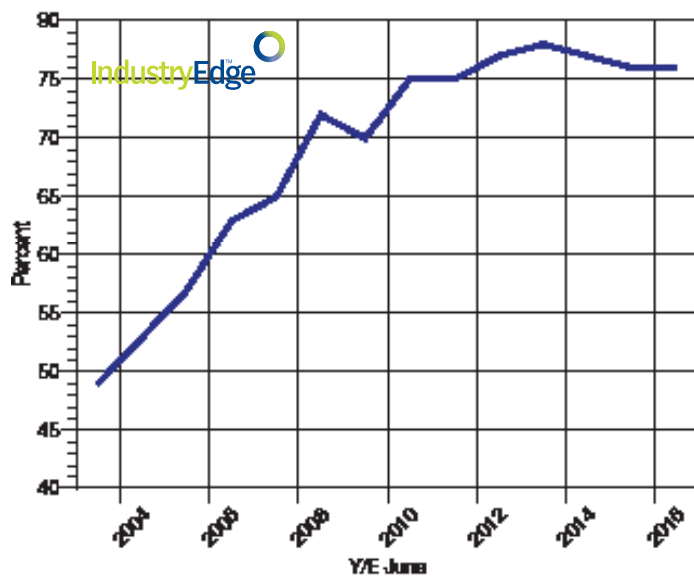
Aware of the value of the materials and needing to ensure their ever growing need for fibre would be met, major paperboard manufacturers changed their strategies.

When co-mingled collections were proposed and introduced by Visy and Amcor (at the time), co-mingling was promoted to Councils as an easy solution, avoiding separate collection systems, with significant cost benefits, reduced contract management and many OHS risks being removed.

That development proved to be stunningly successful.

The chart below shows that for Packaging & Industrial papers (dominated by Corrugated Containers), the recovery rate rose dramatically and continuously for the decade through to 2013, when it peaked at 78%, since which it has plateaued to 76%.

### Australia's Packaging Paper Recovery & Recycling Rate: 2003 – 2016 (%)



Source: APCO & IndustryEdge

Over that period, the amount of recovered Packaging & Industrial paper and board material has grown at an average rate of close to 5% per annum and in 2015-16 topped 2.1 million tonnes. Demonstrating the importance of this fibre supply, more than 60% of that recovered material is used locally each year, primarily to manufacture recycled corrugated boxes. The rest has been exported, and primarily, it has been exported to China.

However, despite this sheer volumetric success, the 'old days' of source separated collections provided, on average, a superior quality of paper and cardboard, because these commodities were kept separate from glass and plastics. Co-mingled collections tend to devalue the commodities placed in our yellow recycling bins. The biggest problem is glass.

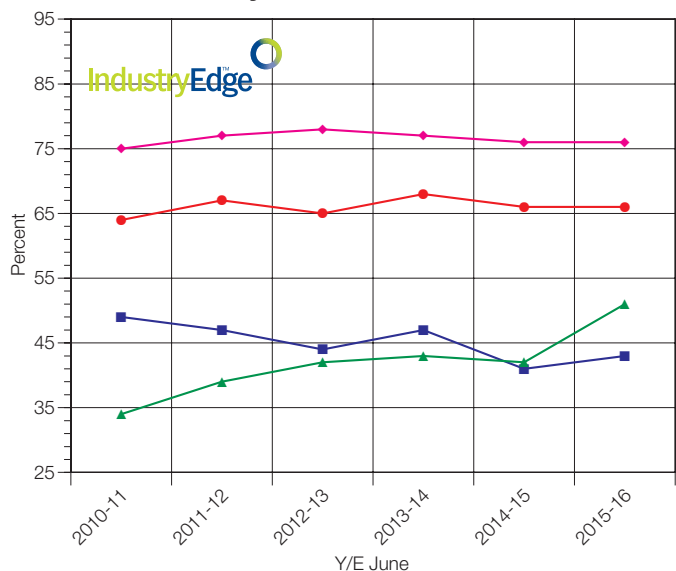
## Paper recycling gets glassed – a big problem for kerbside collections

Glass fines, that is broken glass in a recycling bin, causes the main cross contamination issues impacting other recoverable commodities, especially paper. Over time, economic pressures have diminished the quality of the material, causing fibre in particular, to be contaminated by other materials, especially glass. No one in the paper industry needs to be told what glass fines will do to a paper machine!

The problem is made worse – and possibly was created – by the absence of value in recycled glass. No one wants as much of it as Australians are placing into their recycling bins.

As we can observe in the chart on the next page, Australia's recovery and recycling rates for a range of materials – plastics are not included – has been largely stable over recent years. Of greatest importance is the disparity between the recovery proportions. Paperboard hovers just below 80%, while glass – the problem child – has declined to see just 42% of consumed glass containers being recycled. Recovered glass is unfortunately treated, including by households, with the care its value dictates.

### Australian Recovery Rates for Selected Materials: 2011 - 2016 (%)



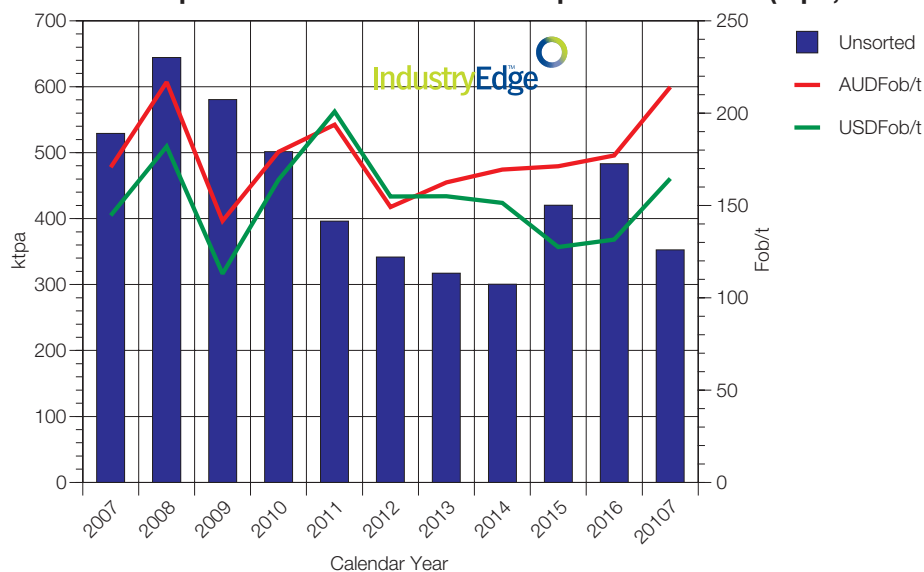
Source: APCO & IndustryEdge

The glass contamination problem is an issue for some OCC, collected at kerbside from smaller businesses and the like. But it is a massive problem for the Unsorted recovered paper collated from kerbside collections. It seems almost inevitable that kerbside material will no longer be received in China.

In 2017, Australia's exports of the 'Other' grade of recovered paper totalled 352,575 tonnes, well below the 438,370 tonnes recorded just a year earlier. Where exactly an approximate 350,000 tonnes of material per year is going to go in the future is an open question, especially as it seems increasingly unwanted by any traditional end-user.

That said, Australia's exports of the unloved grade have declined over the decade, but have not stalled, and prices – at least in AUD terms – are near their average, as the chart below shows.

### Australia's Exports of 'Other' Recovered Paper: 2007 – 2017 (ktpa, AUDFob/t & USDFob/t)



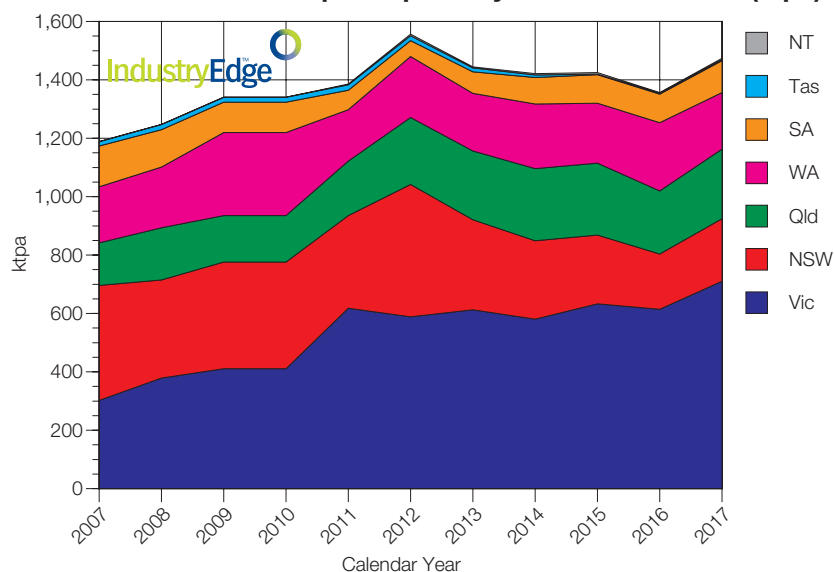
Source: ABS & RBA

But Australia's Unsorted grade experience may be about to come to an end. Latest reports from the US indicate that the price of Unsorted or mixed recovered paper is now zero. No one wants it, at any price. Challenging although this is, Australia has a sufficiently large volume of this material to potentially attract other and new end-users.

## Isn't this just a Victorian problem?

The current crisis has been perceived by some as a Victorian issue. The issue arises, as can be seen below, because Victoria has come to dominate exports of recovered paper from Australia.

### Australian Recovered Paper Exports by State: 2007 – 2017 (ktpa)

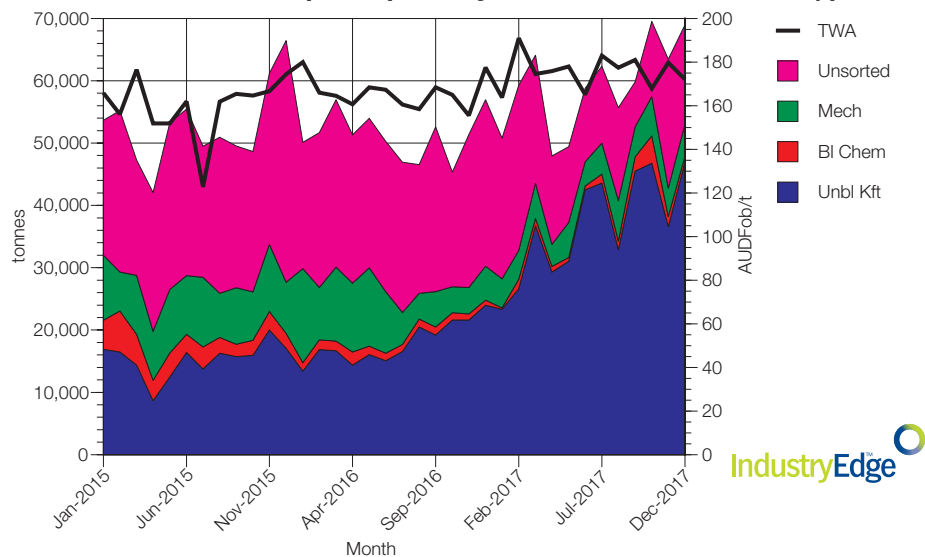


Source: ABS

Largely for structural reasons, Victoria's recovered paper exports have grown proportionally over most of the last decade. In 2017, they accounted for 48.2% of total exports and a massive 710,099 tonnes of recovered material. Reduced local recycling (closures of paperboard mills in Melbourne), and shipment of recovered paper into Melbourne instead of Adelaide, Hobart and Sydney in some cases, have all added to the material that needs to be exported from Victoria.

Drilling into the recent Victorian export data in some detail, one factor is clear. There has been significant growth in exports of Unbleached Kraft or Old Corrugated Cartons (OCC) from Victoria, since the middle of 2016. The monthly data is displayed below.

### Victorian Recovered Paper Exports by Grade: Jan '15 – Dec '17 (tpm & AUDFob/t)



Source: ABS

Monthly OCC exports from Victoria peaked in December 2017 at a record 47,006 tonnes. While Victoria's total monthly exports have been higher, the OCC volume reached new heights. Insiders advise in part this was because exporters were seeking to move product prior to the imposition of the Chinese ban.

It is this OCC volume that is the issue for Victoria. Much of it appears to be below the required quality specifications to be imported into China. *IndustryEdge* has been advised by an exporter that Chinese buyers will still receive OCC, but the exporter anticipates more than 20% will be rejected and returned because it is contaminated.

Suggestions at the time of writing are that New South Wales may allow stock-piling of recyclables at landfill locations, without incurring levies, providing three to six months of breathing space. That seems a short-term solution, at best.

The same exporter advises this is a driver for exporters to push back into the supply-chain in Victoria, demanding that collection, sorting, baling, storing and packing be improved, before bales will be exported.

That is good news for Victoria, and perhaps a wake up call for the industry. It means that as it navigates the challenge, Victoria has an opportunity to be the national leader and engage all parties in a comprehensive overhaul and realignment of the recycling industry, to ensure it has a viable future. Importantly, the AUD13 million package announced by the Victorian government is aimed to support impacted councils to work with industry to introduce long-term solutions.

Despite the emphasis on Victoria, the ramifications are national and cross into all jurisdictions, and every region, suburb and household. Whether the Federal government can be engaged in a solution is difficult to assess. The Feds will be largely reluctant to engage in an issue that has very local impacts.

## One size fits all solutions are unlikely

It is natural to seek a quick fix solution to a crisis. In this case, the attractiveness of simplicity must be tempered with some realities. Short-term challenges need to be met, but the longer-term challenges require structural change. It is unlikely that a single measure will deliver a solution for all materials, all regions and all end markets.

Immediate measures, including those already addressed here, are likely to include funds to cover losses of Material Recovery Facility (MRF) operators because the recyclables still have to be collected and there is no alternative collection infrastructure. Some stock-piling is likely, as are liquidation sales of some recovered paper.

In discussions over the last few weeks, the following are the main opportunities for meaningful and structural change presented to *IndustryEdge* and that may be of interest to the Victorian taskforce.

### Practical and targeted financial support

There is a role for government in supporting re-investment, and yes, that means for taxpayers also. In a world of lower commodity prices, a society that wants its materials recovered and recycled must pay for that option, just as it must pay if it dumps the same materials to landfill.

There is a significant amount of money in State government coffers from landfill levies. That money should perhaps have already been used to help formulate a strategy to address this predictable crisis.

There may need to be a staged and coordinated round of support funding to alleviate immediate issues should there be no alternative outlets in the short term. Any support funding needs to be linked to a long-term goal. This may need some radical thinking by industry, bureaucrats, exporters, processors, domestic users, and government agencies at all levels.

In the medium term, investment in improved sorting and MRFs will create value that can flow back through the supply chain, to improve collection and education opportunities.

### Re-investing in sorting and the supply chain

We would do well to understand that markets in China are still open – so long as the quality specifications are met. However, in general the current MRFs and processors in Australia are not geared up to meet the new specifications required by China.

In that context, processors would be well served to push for long term council contracts in the 10 - 15 year range, allowing for investment in sorting and handling equipment to be amortised over the period of the contract.

MRFs can be retooled to maintain the integrity of the collection supply chain that has delivered so much recovery and recycling in Australia, and meet the quality specifications of China and in future, other recipient nations.

### Alternative export markets will develop

Other export markets are still open in Indonesia, Thailand, India, and Vietnam for plastics and paper from Australia. They will look seriously at the Chinese quality changes. At some point, they will move in the same direction and make the most of a perceived glut of recyclables to offer reduced commodity prices.

As a result, more emphasis is needed on developing alternative domestic re-processing markets for recovered materials.

### New local processing opportunities

*IndustryEdge* is aware of at least three current efforts to harness sufficient resource and support to establish new pulp mills in Australia. At least one of those has recovered paper processing in its sights as a feedstock to supplement virgin wood fibre.

Those considerations are not supply-side driven or focused on the current problems. Each of them is fixated on the global shortage of fibre, and the opportunities that presents for Australia, now and into the future.

Other companies, including some of those in our industry already, are actively engaged in the waste-to-energy debate and considerations. Given Australia's energy challenges, a neat solution may result in lower quality recovered paper becoming a more substantial source of renewable energy in the not distant future, supplemented by plastics.

### Trialling source separation, especially in the regions

Whether you consider it removing the contaminants (mainly glass) or separating the valuable (paper and plastics), the principle is the same – separate the materials at source, retain their integrity and extract their full value.

Sunk capital, infrastructure and a kerb-side supply chain focused almost entirely on co-mingled collection makes change difficult, but not impossible.

Trials will be required and it is likely that regional areas will be the first subjects of any trials. Subsidised and program linked trials would be a useful investment in the future. From a local government perspective, all the evidence suggests ratepayers are more aware of the issues and are prepared to pay for a service that works. Re-wiring the household mind to source separation will of course be a challenge.

Training and skills in all aspects of the recovered paper trade and business is needed in any event, but seems critical for any source-separated trials to effectively extract full value from recovered resources.

*For further information on training opportunities and resources in recovered paper, see the next item in this edition of Pulp & Paper Edge*

## **Beyond the crisis – a more diverse recovery and recycling landscape**

When this crisis ends – as it must – Australia will almost inevitably have a different recovery and recycling sector.

We think it will still be dominated by MRFs, especially in capital cities and major population centres. Thanks to significant new investment, they will sort materials with far greater precision, extracting value that will push back up the supply chain, allowing for more discreet collections and less compression in the collection process.

In regions, some source separation will occur, especially for higher value materials targeting specific end-use markets. Instead of all being overseas, more of the end-uses will be domestic, again supported by investment.

Lower value materials will find their way increasingly into energy production (waste-to-energy) and other applications, especially where the content is organic, rather than mineral.

For paper and paperboard in particular, more material will be used domestically, and it is very likely that pulp (including recovered fibre) will become a higher-value export line than the recovered paper itself.

There will be some new market participants, both in collection and processing, and in operating new end-use facilities.

This viable future will need to include a wide range of considerations, including open and transparent discussions on waste processing and collection methods, quality control, the nature of Council contracts, resident education on what can and cannot be recycled, export market dynamics, waste to energy opportunities, domestic market alternatives, world's best practices, downstream processing, and source separation options.

There are solutions to the current problems with recyclables. The key is for all parties to get involved with a common goal, with support from government. The aim should be to realign the waste industry and shake it up, so that it continues, with some new players, new ground rules, a mix of new and old end-users and alternate markets. This could lead to more local processing.