29th March 2012

Standing Council on Environment and Water Secretariat
GPO Box 787 Canberra,
ACT 2601

Dear Sir / Madam,

Submission in response to the Packaging Consultation RIS

Revive Recycling is an Australian company that provides collection and sorting solutions, including technology and systems design, for the recycling of used packaging containers and other recyclables. It has conducted detailed modelling into the costs of various CDS models, and its management has a 15 year background in recycling and industrial ecology. Revive is the Australian and New Zealand distributor for TOMRA SYSTEMS, the leading provider of sensor-based recycling technology. In addition to the leading automated sorting technology provider for kerbside MRFs and reprocessors, TOMRA is the leading manufacturer of reverse vending machines and have various levels of engagement in almost all CDS systems worldwide, including those where they operate collection points and a number where they run the whole system as coordinator.

Revive introduced the first RVM into Australia, and its principals have extensive (>12 year) experience in kerbside systems and technology at MRFs. As a result it has a unique insight into the pros and cons of both kerbside recycling and CDS.

Revive Recycling has been actively engaged in various government inquiries and considerations of CDS over a number of years, including throughout this RIS process since the first consultation meeting. In that time it has provided lengthy and detailed submissions based on our expertise in this area with the aim of informing the process. It has developed detailed modelling of CDS costs in an Australian market context and it put forward a fully developed CDS model for inclusion as one of the options in the Consultation Regulatory Impact Statement (CRIS).

However recent events have undermined Revive's confidence in the process and its "consultation":

Concerns with the CRIS process, consultation and legitimacy

1) Firstly, despite direct offers of input of detailed information and modelling (albeit with some of it on a commercial- in-confidence basis) there was a lack of any consultation from the RIS consultants beyond the public forums.

   Revive's modelling shows that, with effective system design and use of automation (where appropriate) system costs could be reduced significantly from those currently on display in SA and the NT (where handling fees are among the highest in the world, by some distance) to the point where, based on the RIS analysis, the system would run at a surplus and provide a net positive NPV even before consideration of environmental benefits.

   It is of particular concern and surprise to us, therefore that, if a serious evaluation of CDS operations and costs was intended, we were not specifically consulted or given the opportunity to share our modelling, expertise and understanding of the SA and international CDS markets. After all we

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represent the leading international advanced technology supplier to the recycling industry and a company that runs many of the CDS schemes internationally and is significantly involved in almost every single one.

2) Instead, however, we were advised by the lead RIS consultant that the CRIS "terms of reference" did not include evaluation or analysis of the figures put forward by the advocates of the various options, and that effectively the consultants' role was limited to assembling the options, laying out costs and benefits as received, and making comparisons without independent judgement. By extension we were told that there was therefore no point in sharing our detailed modelling for analysis.

   From our point of view, this seems to undermine the whole legitimacy of the RIS and the independent analysis it was expected to provide.

3) As it turns out, however, this statement to us seems to have been inaccurate since the CRIS itself shows that consultants have indeed adjusted CDS options costs significantly upwards from the authors' projections in order to mirror SA CDS costs. This is despite the CDS models being developed deliberately to learn from international experience and employ proven technology to be more efficient (as mentioned above, SA has some of the highest CDS handling costs in the world).

   Indeed it is hard to understand the justification for applying SA costs to a national best practice model using international experience that is using RVMs for up to ~73%[1] of redemptions and bulk redemption by weight for much of the rest. This is akin to modelling kerbside costs still based solely on manual collection and sorting because the consultants do not have the time or inclination to learn about modern collection and automated sorting methods.

4) Finally, after having our own detailed and fully developed CDS model politely rejected as an option for consideration within the CRIS, we learn that the second CDS option developed for the CRIS was authored by a consultant who is a well-known opponent of CDS, publicly arguing against such systems in various forums and indeed previously representing BIEC[2] to oppose a CDS.

As a result of the above, and recognising the overwhelming influence of highly questionable assumptions in the CRIS that frankly undermine any basis to its ranking of benefit-to-cost ratios (BCR) and NPV, Revive is questioning the purpose of its significant efforts at engagement with the process and in developing detailed submissions. As such we have chosen in this submission to limit our focus to only a couple of areas.

1. Major economic benefit of CDS not addressed

Economic value of increased recycling volumes and improved recyclate quality flow beyond scrap sellers and is not captured in the CRIS.

Economic value created in Australian reprocessors should be included in all options where they result in increased recycling volumes (over baseline) reprocessed in Australia, which will be the case for all major material types considered in the CRIS.

Such economic value may be generated by increasing throughput in existing plants or through investment in new plants. In both cases, however, there is significant additional value created in Australia that is not accounted for by artificially limiting the boundaries of an economic analysis to the sale of "scrap" recycled packaging.

[1] Several markets including Germany, Norway, Sweden, Denmark, Finland and the Netherlands have higher rates of automated redemptions through RVMs (ranging from 80% up to beyond 90%) so this itself is not unusual.
[2] Beverage Industry Environment Council, the forerunner to the current PSF.

For example, a significant increase in the supply of recycled PET bottles in Australia will lead to additional reprocessing in Australia. The reprocessors will buy recycled PET bottles at the scrap price, reprocess it at a certain cost (a portion of which is itself new economic value to Australia – e.g. wages, Australian supplies) and then add a margin (a direct economic benefit to the Australian economy) for sale to manufacturers.

Not just quantity…….

In addition, the example of PET reprocessing can be used to illustrate how the quality of the scrap material (recycled PET bottles and their degree of contamination) also has a direct effect on the additional economic value available to the reprocessor.

For instance, the quality of reprocessed PET flakes sourced from most kerbside material is generally suitable only for application in larger, lower volume market applications such as polyester fibre (which is much more tolerant of the weakening properties that result from contamination in the kerbside commingled streams). On the other hand CDS-sourced PET can be readily processed into highest margin applications such as bottle-to-bottle recycling that require stringent contamination limits (e.g. <10ppm PVC in PET) and **the market price differential can be several hundred dollars per tonne.**[3]

It is important to note that only a fraction of this additional economic value is captured in the price premium on the scrap material from CDS options. Rather, the financial benefits of material with lower contamination – e.g. from CDS – are shared between the parties in the supply chain and likely skewed towards the reprocessor, and so **ignoring these benefits fails to quantify the full economic and financial benefits available from CDS options**.

Similar principles are true for other plastics. In other materials – e.g. aluminium cans and glass – the main additional economic benefit to reprocessors of CDS material will be reduced secondary sorting (to remove contamination) or 'beneficiation' costs, rejections and wastage. These too can be significant and are not fully captured in the price premium paid for scrap material.

On the other hand, for low quality recycling or "downcycling" (a substantial part of the output of existing kerbside and C&I systems due to contamination and/or breakage) – e.g. use of unsorted glass as roadbase - the extra value will be low or possibly zero (justified only by the avoided cost of landfill). Even for highest kerbside output qualities the end market prices and/or, and additional economic value created, are significantly lower than those for CDS materials (as illustrated in the PET example above).

In summary then, there is significant additional economic value attributable to Australian reprocessors due to the extra value they create directly as a result of the CDS material purity allowing them to a) access higher quality /value applications with greater market prices and/or b) reducing costs of reprocessing. Such value is on top of, or additional to, the extra price paid by reprocessors for CDS material, and is not currently captured in the CRIS.

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One final point on material values: we were pleased to see the CRIS take into consideration the price premiums paid by reprocessors on CDS material streams vs the same streams collected via kerbside, which has been long established. We note however, that the price premium on plastics is offset by a failure to take into account the plastic material mix in CDS streams vs those in kerbside. Based on the CRIS mix of CDS plastics, the average plastic sales price, without premium applied, would be $730/tonne vs $560/tonne for the average assumed plastic mix collected in kerbside (and vs $660/tonne for the CRIS assumed CDS plastic scrap price including the CDS premium). If the same premium for material purity were applied, the assumed CDS average plastic scrap price should be $830/tonne, which just in itself **would result in an additional economic benefit for CDS options of approx $23 million per annum.**

[3] Market price data is available through market information services such as ICIS, or SBA-CCI Inc.

2. Inaccurate and unrepresentative recycling rate data

As stated in previous submissions, current packaging recycling rates are flawed and dependent almost entirely on APC data which are presented as "fact" with the underlying assumptions and estimates largely hidden or at least not sufficiently transparent.

There are many data holes that mean that the numbers presented in the RIS need to have clear caveats each time they are used. Problems with the data include:

- An underestimate of consumption (that has the effect of raising reported recovery and recycling rates above their real rates)
- Over-estimates of recovery
- Over-estimates of recycling – due to both the over-estimates of recovery AND under-estimates of loss due to contamination and breakage etc.
- APC data is based on voluntary reporting by packaging suppliers, fillers and manufacturers, councils, MRFs and reprocessors, almost all of whom have an interest to present rosy pictures of recycling. There is no independent audit function.

Specific examples of the problems include:

- In the case of beverage containers, imports of full containers are omitted or under-reported in consumption data, due to difficulty of tracking this data. This results in recovery and recycling rates being over-reported, and also understates the volume (tonnes) of additional beverage packaging material that would be recycled under CDS options.

- Downcycling is included in recycling numbers without differentiation. For example, glass recycling figures include applications as "sand/soil substitutes" and "road surfacing"[4]

- Large stockpiles of glass have built up over many years and when reduced - through downcycling, or otherwise sorted for recycling - in subsequent years they have the effect of falsely boosting those years' reported recycling rates. There are circumstantial reports of this being a factor in increased glass recycling rates in recent years.

- The packaging recycling rates (e.g. of plastic) include pre-consumer manufacturer waste[5] sent for recycling which is not a part of packaging consumption figures and therefore falsely boost reported recycling rates.

- Packaging recycling rates (e.g. of plastic) also include recovery figures (i.e. including contamination and hence not valid volumes of "recycling") of plastics that are exported for reprocessing[6]. In Revive's experience such exports typically have higher contamination rates than plastics sold for local reprocessing due to lower specifications required and ability to conduct secondary sorts in Asian markets at low cost.

- Plastic recycling rates also include imports of plastic resins for recycling[7], which clearly distorts the actual recycling rate of plastics consumed in Australia

- Details of the calculation of recycling volumes from recovery volumes are opaque and not described even in the NPCC's Packaging data collection methodologies (2009). However the evidence from previous reports (as well as industry commentators and direct experience) is that the losses due to breakage, contamination and waste between "recovery" and "recycling" (even including downcycling) are understated, and recycling figures are likely to be significantly lower.

[4] National Packaging Covenant Council 2009, Packaging data collection methodologies.
[5] Ibid.
[6] Ibid.
[7] Ibid.

In particular it is not clear as to whether losses beyond the MRF stage of material flows are included when recovery rates are adjusted to reflect real recycling. A recent US study found that the additional losses after materials leave MRFs can be up to twice as large as the MRF residue rate, and that total losses from commingled collections (the vast bulk of Australia's modern day recovery flows) range between 22 and 27%. The figure is likely to be even higher for material exported to Asia where specifications are typically looser. A similar study is warranted in Australia, particularly in the context of the CRIS.

The above, particularly when taken in aggregate, have the effect of significantly overstating a) current recycling and the projected baseline recycling rates, and b) the achievement of options that look to extend current approaches (e.g. Options 2 and 3). They also have the effect of significantly understating the additional tonnes recycled over the baseline by the CDS options.

In a RIS of this scope and importance, primary independent research should be conducted to establish real consumption and recycling rates. The failure to do so, with the data assumptions being of such a scale that it influences end conclusions, tends to undermine the CRIS CBA and we would strongly recommend that primary independent research is conducted as part of any decision RIS.

3. Inflated projections for the baseline and Options 1-3

In view of the above data problems, the baseline assumptions and projections, and by implication, the projections of the outcomes of Options 1, 2 and 3 are likely to be significantly over-stated and at the very least highly uncertain. However there are other major concerns over the assumptions used that once again undermine the fundamental cost benefit analysis (CBA):

- The CRIS CBA (Attachment C, p2) states that recycling projections are based on "the maximum recycling rate that is considered feasible". The "maximum feasible" recycling rate is clearly not the same as the ***likely*** recycling rate, and is clearly oriented to the optimistic end of projections. This in turn biases the CBA towards Options 1,2 and 3 that have high degrees of uncertainty in their projected outcomes, and against Options 4, which have demonstrated results in Australian and internationally and hence have lower levels of uncertainty in their projected performance. This also tends to inflate the baseline so that the net benefit of Options 4 (relative to that baseline) are understated.

- The assumed base case recycling rate increases are arbitrary. At least as good a case could be made to make a completely different set of assumptions that would totally undermine the outcomes of the CRIS. For instance:
    - What is the justification to assume recycling rates will continue to expand almost linearly and then tail off only at 79% (even as marginal increases will come at increasing costs) and why are they not assumed to level off much earlier?
    - There is no recognition of the problems in recycling data (mentioned in Section 2 above) and the implications these have on establishing the real trend in recycling.
    - What is the justification for assuming that the vast majority of any increased recycling rates have been achieved through NPC/APC actions which are assumed to underwrite the strongly increasing baseline projections (yet which constitute a very small percentage of overall funding and activity in packaging recycling), rather than
        a) increasing market prices and export demand over the last decade – which are potentially subject to reversal as during the early 2000s (or indeed post-GFC when the recycling rate fall back appears to confirm this strong link)

b) expansion and increased local government investment in kerbside - which is now reaching budget limits and facing diminishing returns as at-home recycling becomes saturated

If either a) and b) are more prominent in influencing recycling rate increases, as would be expected, then continuing increases in recycling cannot be expected, let alone guaranteed.

- Why can we assume recycling rates including beverage container recycling will continue to rise at such a rate when in the US beverage container rates have actually fallen over the last 15 years[8], and only risen in Europe due to strong regulatory requirements?

- The assumed additional relative impacts of Options 2 (incl. sub-options) and 3, are equally arbitrary. Rather than examining the planned initiatives and then analysing the realistic increases in recovery and recycling they will generate, the CRIS simply accepts budgets provided for these plans with seemingly unrelated and arbitrary targets as if they are realistic performance outcomes. Initiatives beyond 5-15 years are not even planned or described (see Attachment C p 21) but rather a budget is attached to an arbitrary target which is then assumed as the performance outcome for the CBA. To our knowledge, there is no market in the world that has achieved such high packaging diversion rates at such low costs and without strong regulatory underpinning.

- Assumed recycling rates are all calculated on the basis of two key assumptions (Attachment A: Problem Statement for Packaging, p 73):

  - The at-home and away-from home consumption split, and
  - The overall at-home recycling rate

  In reality the two of these are directly linked since the overall at-home recycling rate is calculated based on assumptions about the at-home consumption volumes, and both are derived (at least in part) from the one source, the AFGC report, Australian Beverage Packaging Consumption, Recovery and Recycling Quantification Study, 2008.

  The assumptions behind the at-home and away-from-home consumption split therefore have very considerable influence over projected results. However the AFGC report is likely to significantly under-represent away-from-home consumption due to (once again) broad underlying assumptions such as:

  - that beverages (of most material types) purchased through supermarkets are consumed at-home (and so none are taken to work, to school or to the local park etc.).
  - that the discrepancy between NEPM data and NPC data on glass (which constitutes >70% by weight of all beverage containers and so has a large influence on overall recycling rates) should be resolved by accepting the NEPM data (usually considered less reliable) rather than by adjusting the % of glass consumption at-home upwards to reflect observed at-home recovery rates.

  This simultaneously has the result that significant further improvements are projected for overall beverage container recycling through increasing glass at-home recycling, when in reality the marginal potential gains may be far smaller than estimated.

[8] Container Recycling Institute www.container-recycling.org accessed March 2012.

Realistically such assumptions mean that there is very little certainty in the projections (including baseline rates), which should be tested for a far wider range of assumed away-from-home consumption splits – e.g. 25% to 50%.

- The APC website itself states that the 2008 NPC review, "supported by independent projections" forecast the 2010 packaging recycling rate to be between 64% and 67% by 2010[9]. Its own reported figures for 2011, one year later, demonstrate that this rate has yet to be achieved. If over-optimistic projections are made for just 2 years in the future how can the projections taken as the "baseline" over 25 years be deemed accurate?

On the cost side too the assumptions appear far-fetched:

- The marginal cost assumptions already raise a flag – the CRIS itself states that WCS estimates of the current cost of post-consumer management of packaging materials is $800 million per year, yet the incremental difference in spend for Options 2 a) to 2 c) and 3 amount to just $2 million per year (0.25% of current spend), to 42.4 million (5.3% of current spend) for improvements in recycling of 4%[10] of (RIS assumed) baseline and 8% respectively. This should already raise concerns about the credibility of such projections, and is even more suspect when one considers that the low hanging fruit have already been picked (lowest cost options would be expected to have been pursued in the 13 years of Covenants that have already occurred) and marginal costs are only likely to increase.

- As an example of costs that appear unrealistic, we conducted a "reality check" on WCS's estimate of a$26/tonne average transport cost for away from home collection of recyclables (Attachment C, p 119). The following outline analysis indicates the scale of potential flaws in modelled costs of Options 2 and 3:

    - Actual current fee per pick up to small business operator (18 staff) for 240L commingled container bin: $22.16 / bin (net of GST). Collection is by a major national kerbside and C&I waste service provider.
    - Average weight of bin contents: ~13kg (assuming average beverage container mix); Value of material: approx. $3.70.
    - Collection cost per tonne is therefore $1705. Material value per tonne = $285. Total income to collector = collection fee + material value = $1990.
    - If cost of collection is only $26/tonne, and the cost of then sorting at a MRF is $85/tonne (Attachment C, p58) as per CRIS assumptions, then exorbitant profits (a 94% margin of $1879 / tonne on a cost of $111/tonne in this case) are being made!
    - Of course compacted collection from very large institutions, shopping centres etc. will be far more efficient per tonne (though even then $26/tonne seems optimistic since there is a limit to compaction of beverage containers which include glass). However, ABS figures indicate that 49% of the working population work in small business and so the costs for at least this 49% of workplace recovery volumes are likely to be closer to $1990 / tonne (less reasonable margin) than $111 / tonne ($26 + $85 per tonne).
    - Assuming a $26/tonne cost for collection and transport of recyclables in "away from home collection" appears to be cherry picking the absolute most efficient scenario and then applying that across all away-from-home locations as an average.

[9] http://www.packagingcovenant.org.au/page.php?name=fromnpctoapc, accessed March 2012
[10] By 2020

- It is also insightful to compare the $26/tonne assumed cost of away from home collection for Options 2 and 3 (as above) with the assumed cost of transport from collection points to hubs in CDS Option 4a:
    - CDS transport costs should be significantly less than average away-from-home C&I pick-ups planned for Options 2 & 3 for away-from-home recovery of beverage containers for the following reasons:
        - Volumes per site will be far larger than average C&I pick-up points
        - Much of the material will be compacted (via RVMs) in the model proposed in Option 4
        - the average transport distance between CDS collection point and hub is likely to be less than the average distance between C&I collection points and the nearest MRF (there will be more hubs than MRFs).
    - However, the CRIS has costed CDS transport at 0.72 c/ container or roughly $88/ tonne for an average mix of containers, but has costed the average C&I pick-up at $26/tonne (as noted above).,
    - **The CDS transport costs are assumed at over 330% of the C&I rate, when, if anything the ratio should be the other way around.**

- Another example is the assumption that there will be no additional cost to facility owners[11] (relative to the base case) to introduce separate recycling bins (Attachment C, p64). Even for large facilities this is a significant assumption since under the base case waste is collected and typically sent to a compactor (lowering pick up costs). For recycling, compaction must be limited and, where present, it will require investment in an additional compactor and storage space for it. For others, particularly small business with high collection costs, two trucks will now be required to pick up waste, and the new recyclable stream, and it is clear that pick-up costs will rise substantially since the cost is related more to the number of pick-ups and time involved than the overall volume of waste and recyclables (which remains unchanged). These costs on a wide range of workplaces, however, have been ignored in the CRIS.

In conclusion, I would like to thank you for the opportunity to make this submission and to provide our input which I hope will be useful in refining the RIS and ensuring it is an accurate, transparent and realistic comparison of the options available to improve community recycling outcomes.

Yours faithfully,

Markus Fraval

Chief Executive Officer

[11] Workplaces, shopping centres, institutions etc.