Verification Review of Revised Beverage Container Investigation Report

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1. Introduction and Conclusions

This short note provides a review of a revised report by BDA Group and Wright Corporate Strategy of a *Beverage Container Investigation*. The report we have examined is dated 28 April 2010. We have been asked to consider three things:

1. The appropriateness, or otherwise, of attributing a value for the increase in materials recovered (over and above the base case) as an economic benefit of a national CDS, as opposed to the value of the total materials recovered;

2. The accuracy of the proposed revision to the dollar values of economic benefits for materials recovered under a national CDS (ie a revision from $242m per annum to $54m per annum); and

3. The appropriateness, or otherwise, of the revision to the lost material values attributed to local governments under a national CDS (ie a revision from $47m per annum to $90m per annum).

Our overall conclusions are that BDA/CVS:

- **Have used an appropriate approach** to analysis in measuring the value of the increase in materials recovered rather than the value of the total materials.

- **Have not used a consistent set of data for analysis of the different issues in the report.** It appears that their kerbside/drop-off data used to estimate impacts on local government revenue include volumes of food containers in addition to beverage containers.
  - Developing a consistent set of *beverage container* data would lead to a change to the estimates of costs to local government (Question 3 above).
  - We are unsure if it would also lead to a change to the estimate of total value of materials recycled with and without the CDS (Question 2) or only to a redistribution of the total across the different sources (kerbside, CDS, commercial & industrial).

  In making this comment, we note that using a consistent dataset is unlikely to make a significant difference to the results.

- On the basis of the volume data that they have assumed for overall changes in quantities recycled, with and without the CDS, **they have accurately revised the dollar values** of economic benefits for materials recovered under a national CDS, from $242m per annum to $54m per annum.

The different components of our analysis of the report are set out below.

2. Have They Adopted a Valid Approach (Question 1)?

In the revised report, BDA/WCS have analysed the change in total costs and benefits as a result of moving from existing levels of recycling to that which would result from introducing a CDS. This is appropriate and a valid approach to analysis. However, measuring the costs and benefits associated with the total volume of materials could also be appropriate if they had used a different approach to comparing options.

The decision being addressed by the government is whether or not to adopt a CDS (or some other policy instrument). To assist in that decision, the cost benefit analysis is used to compare options. To explore how this might be done, we set out in Table 1 some simple and hypothetical policy options: current policy and three options with different quantities recycled and different costs and benefits.

Table 1 Analysis of Hypothetical Policy Options – Total Impacts

	Current policy	Option 1	Option 2	Option 3
Quantity recycled	100	150	200	300
Cost	100	175	300	500
Benefit	150	250	400	450
Net Benefit	50	75	100	-50

Table 1 shows the total costs and benefits of each option. A ranking can be produced on the basis of the net benefit:

Option 2 > Option 1 > Current policy > Option 3

The same information can be presented by examining changes from current policy. The results are shown in Table 2.

Table 2 Analysis of Hypothetical Policy Options – Incremental Impacts

	Option 1	Option 2	Option 3
Additional quantity recycled	50	100	200
Additional cost	75	200	400
Additional benefit	100	250	300
Additional net Benefit	25	50	-100

The ranking of the options is the same as in Table 1: options 1 and 2 are better than current policy, and Option 2 is the best (highest additional net benefit). Option 3 is worse than the existing policy (it has a negative result).

For decision makers either approach provides useful information and it does not matter which approach is used, provided that each option is analysed in the same way. In all cases the policy options are being assessed against some other possible world, ie there is a factual (the estimated effects of the policy option) and a counter-factual (what would have happened otherwise). It does not matter what the counter-factual is, so long as the analysis is consistent across all policy options.

- When analysis is undertaken of total costs and benefits, the assumed counter-factual is zero recycling.
- When analysis is undertaken of incremental costs and benefits, the assumed counter-factual is current levels of recycling.

The ranking of the options would be the same regardless of the chosen counter-factual, eg it would be the same if all options were measured relative to a counterfactual of option 3.

Measuring only the changes in impacts relative to current policy, as BDA/WCS has done, is a valid and useful approach, provided that the impacts of all policy options have been measured as changes relative to the same baseline. This is what the change to the CDS analysis accomplished.

3. Are the Changes Accurate?

The accuracy of the changes is assessed below to address questions (2) and (3) above.

Economic Benefit Values (Question 2)

The impacts of the volumes recovered on total material values are shown in Table 3. The values are taken from Table A6.4 on page 67 for the base case, and Table B1.3 on page 88 for the additional impacts of the CDS. The first column of numbers shows the estimated levels of recovery of beverage containers under the base case; this equals 655,745 tonnes. The second column represents the BDS/WCS estimate of additional recovery under the CDS; this totals 333,300 tonnes.[1] These figures are summed to estimate the total quantity of material recovered under the CDS: approximately 990,000 tonnes.

Table 3 Value of Beverage Container Material Collected by CDS

	Base Case Collection (tonnes)[1]	Additional via CDS (tonnes)[2]	Total Via CDS (tonnes)	Material Value ($/tonne)[3]	Additional via CDS ($'000)	Total via CDS ($'000)
Glass	509,754	258,300	768,054	70	18,081	53,764
Aluminium	43,830	1,300	45,130	2000	2,600	90,260
PET	59,028	19,000	78,028	700	13,300	54,620
HDPE	28,212	19,100	47,312	750	14,325	35,484
Steel	183	500	683	75	38	51
LPB	12,680	29,600	42,280	150	4,440	6,342
Other[4]	2,058	5,500	7,558	135	743	1,020
Total	**655,745**	**333,300**	**989,045**		**53,526**	**241,541**

Source: [1] Table A6.4 on page 67; [2] Table B1.3 on page 88; [3] Table B1.6 on page 91; [4] Other = "other plastic" Drew Collins, BDA, personal communication)

Material values for the different materials are taken from Table B1.6 on page 91 and, using these, we can reproduce the numbers used as the new value of the additional materials recovered ($54 million) and the original estimate ($242 million).

[1] Our estimate from summing the values in the table for the individual materials is slightly different from the total in the report: 333,300 tonnes versus 333,400 tonnes. This may be due to rounding.

If we assume the aggregate volume data presented here are correct, the calculation of change in total material revenues appears to be correct. However, below we examine some issues that arise over the accuracy of the volume data.

Impacts on Local Government Revenues (Question 3)

The impacts on local government are determined by changes in quantities being returned by kerbside and drop-off. Below we examine the changes in volumes and then examine the implications for revenues.

Volume Data in the Report

Table 4 provides the BDA/WCS estimates of levels of recovery in 2010 through different routes.

Table 4 Estimates of Beverage Container Recovery via Different Routes

Resource Recovery System	Recovery in 2010 (tpa) (No CDS)	Recovery in 2010 (tpa) (With CDS)
Municipal kerbside collection + Drop off	540,000	70,000
Container deposit scheme	40,000[1]	820,000
C&I collection	80,000	100,000
Total	**660,000**	**990,000**

Source: Table B1.2 (p87)
Notes: [1] South Australia only

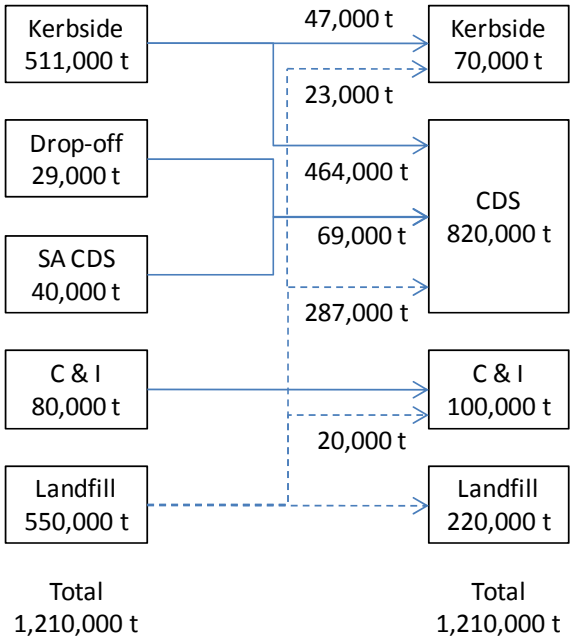
Firstly we check if these are recycling numbers. They are confirmed as recycling numbers rather than simply recovery by examining the way in which the data are presented in Table A6.4 for 2007 (the 501,545 tonne recycling figure for 2007 we know to be a recycling number)[2] and 2010 (655,744 tonnes in A6.4 is rounded to 660,000 t in Table B1.2), as though they are on the same basis.

We note that the kerbside/drop-off volumes in 2010 with CDS include some quantities that are assumed to be recycled via kerbside/drop-off in the base case and some that are additional. In Appendix 7 (Section 7.6 on p199) it is stated that 7% of the additional recycled material (333,402 tonnes) is recycled via kerbside/drop-off and 93% via the CDS. This means, of the 70,000 tonnes of kerbside/drop-off recycling with the CDS, approximately 47,000 tonnes would be recycled via kerbside/drop-off without the CDS and 23,000 tonnes would be additional tonnes that would be landfilled under the base case.

The above summary gives us the basic data and we use this to construct the overall estimates of how volumes are changing, with and without the CDS, in Figure 1 below. We split the kerbside volume (540,000 tonnes) between kerbside and drop-off assuming the same percentage mix as in 2007 recovery (Table A2.4 on p37). The CDS is obtaining volumes from four separate alternative routes: (1) current kerbside = 464,000t, (2) drop-off sites = 29,000t, (3) the South Australian CDS = 40,000t, and (4) landfill = 287,000t.

[2] Table A2.3(a) on page 35 and in Table A6.4 on page 67

Figure 1 Estimates of Changes to Flows - with and without CDS



Source: Covec estimates from BDA/CVS report

Additional Data

To estimate the material values, additional data were required on the mix of materials being recycled via kerbside/drop-off with and without the CDS. These data were provided by BDA and are reproduced in Table 5;[3] for comparison, the Base Case total (from Table 3) is included as a separate column. The Base Case data include kerbside/drop-off volumes plus volumes included in other streams (the South Australia CDS and commercial & industrial streams).

Table 5 Kerbside/Drop-off Volumes 2010

	Market value ($/tonne)	Base Case total (tonnes)	Kerbside (no CDS) (tonnes)	Kerbside (CDS) (tonnes)
Glass	70	509,754	422,683	54,560
Aluminium	2000	43,830	13,209	1,705
PET	700	59,028	39,627	5,115
HDPE	750	28,212	21,265	2,745
Steel	75	183	26,418	3,410
LPB	150	12,680		
Other	135	2,058	13,209	1,705
Total		**655,745**	**536,411**	**69,240**
Total value ($m)		188.0	103.5	13.4
Difference ($m)				90.1

Source: Drew Collins (BDA), personal communication, apart from Base Case total from Table A6.4 on page 67

[3] Obtaining these data was initiated because an initial analysis to attempt to reproduce the revenue data on the basis of the average value of materials in the different material streams led to discrepancies

The total values of the materials are estimated from the volumes of the different materials and the market values in the first column of numbers. **The difference between the total value in the final two columns ($103.5 million and $13.4 million) is the source of BDA/WCSs estimate of a $90 million cost to local government.**

However, there are some issues of concern with these data. The kerbside/drop-off volumes provided by BDA include large quantities of steel and other plastic, particularly in the base case (26,418 tonnes and 13,209 tonnes respectively). This is significantly higher than the Base Case totals for these materials (183 tonnes and 2,058 tonnes respectively), and note the Base Case volumes should include all of the kerbside/drop-off volumes plus volumes recycled via other routes.

We requested an explanation from BDA and were told that different data sources were used. We believe that the only explanation for the differences is that the data used to estimate kerbside/drop-off volumes includes containers that are not beverage containers: the large quantities of steel and other plastics are most likely to be food containers. If we exclude these volumes from the estimates of kerbside/drop-off volumes, the resulting estimates of the change in local government revenues are as shown in Table 6. The difference between the totals without these volumes is $87 million, very similar to the BDA/WCS estimate.

Table 6 Alternative Kerbside/Drop-off Volumes 2010

	Market value ($/tonne)	Kerbside (no CDS) (tonnes)	Kerbside (CDS) (tonnes)
Glass	70	422,683	54,560
Aluminium	2000	13,209	1,705
PET	700	39,627	5,115
HDPE	750	21,265	2,745
Total		**496,784**	**64,125**
Total value ($m)		99.7	12.9
Difference ($million)			86.8

However, this reduces total kerbside volumes by approximately 40,000 tonnes and we are unsure if this will affect overall estimates of CDS volumes as per Table 4, if kerbside volumes for other materials need to be scaled upwards or if the 40,000 tonnes needs to be redistributed across other sources in Table 4, eg commercial and industrial recycling.

We appreciate the difficulties of working with data from different sources, but it appears that BDA/WCS have not developed a single, consistent set of assumptions of material flows through the different pathways. Because of this there are data discrepancies in the report which, ideally, would be corrected. Doing so is unlikely to make a significant difference to the results, but it would provide greater confidence in the analysis. It would require that the total quantities (as presented in Table 3 or some modified version) are mapped to the different sources/destinations, such as pictured in Figure 1.

Kerbside Mix

We noted above that BDA/WCS have assumed that, of the 70,000 tonnes of kerbside recycling after the CDS is introduced, 23,000 tonnes are additional materials that are currently landfilled, with the balance coming from base case kerbside recycling (see Figure 1). We are unsure as to why BDA/WCS have bothered to add this complexity to the analysis, rather than assuming that all of the kerbside volumes under the CDS would also be kerbside volumes under the base case. We ask this as, when we examine the more detailed kerbside material mixes, we note that they have assumed that the percentage mix of materials in the 23,000 tonnes diverted from landfill is exactly the same as in the 47,000 tonnes from base case kerbside (or the final mix is the same). The assumption that they have made raises more questions, eg it means that, whereas 7% of glass in the 333,000 tonnes of additional CDS material is diverted from landfill to kerbside, 43% of aluminium is.

The effects of these assumptions are small on the overall result, ie the impact on local government.