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January 22, 2014

Wayne Gjerde  
Minnesota Pollution Control Agency  
520 Lafayette Road N  
St. Paul, MN 55155-4194

RE: Comments on Draft Report to Minnesota Pollution Control Agency (MPCA)  
*Recycling Refund System Cost Benefit Analysis*

Dear Mr. Gjerde,

The Container Recycling Institute is pleased to submit our comments on the draft report *Recycling Refund System Cost Benefit Analysis, prepared by Reclay StewardEdge (RSE)*.

#### **About CRI**

Founded in 1991, the nonprofit Container Recycling Institute is a leading authority on the economic and environmental impacts of used beverage containers and other consumer-product packaging. Its mission is to make North America a global model for the collection and quality recycling of packaging materials. We do this by producing authoritative research and education on policies and practices that increase recovery and reuse; by creating and maintaining a database of information on containers and packaging; by studying container and packaging reuse and recycling options, including deposit systems; and by creating and sponsoring national networks for mutual progress. CRI envisions a world where no material is wasted and the environment is protected. It succeeds because companies and people collaborate to create a strong, sustainable domestic economy. Please visit CRI at [www.container-recycling.org](http://www.container-recycling.org) and [www.bottlebill.org](http://www.bottlebill.org)

#### **General Comments**

The report, *Recycling Refund System Cost Benefit Analysis* is clear, logical and easy to read. We appreciate that the consultants carefully considered all of the features in their description of the recycling refund system beginning on page 4 (Section 1.3). The list offers valuable insight, which can greatly inform the development and implementation of a “best in class” system.

The findings of the report have been provided in a transparent manner to clearly demonstrate that the vast majority of costs are paid by consumers who choose not to redeem their container (polluter-pays principle), thereby forfeiting their refund to pay for the program. This analysis also clearly demonstrates that participating consumers do not incur direct costs, and producers may incur a net cost about half a penny or less per beverage sold. Furthermore, the report should point out that the proposed system is not funded by taxpayers or ratepayers, and represents a shifting of costs to consumers and producers, as is the case with other Extended Producer Responsibility (EPR) programs.

We also support the finding of job gains to the system from increased material collected. Most of these jobs will benefit Minnesotans from increased collection, transport and processing of material. Jobs are also

supported in secondary processing facilities and manufacturers utilizing recycled content versus virgin feedstock. Recycling glass creates 8.3 jobs per 1,000 tons processed, versus only one-tenth of a job for producing that same glass from virgin materials. Recycling PET creates 9.9 jobs per 1,000 tons processed, versus only 0.6 jobs for creating the same material from virgin resin. Meanwhile, our glass and PET processors in the U.S. and in Minnesota are hungry for more material, and the PET reclaimers nationwide are operating at only about 50% capacity, on average. However, a key to job growth is high quality collection and sorting. CRI's jobs study, *Returning to Work*, found that high quality materials were far less likely to be exported to China, which means that those materials stayed in the U.S. and went on to support U.S. manufacturing jobs, which are high-quality, high-wage jobs.

The report neglects to mention certain environmental benefits of a container deposit-refund system, such as energy savings and reduction of greenhouse gases and toxics. For instance, the increase in recycling created by this proposed system would save energy equivalent to that needed to power over 30,000 homes.

Our comments offer supporting discussion as well as recommendations to make the analysis even more robust, informative and transparent.

### **1. Program operating costs are high**

The greatest cost component of deposit return programs are handling fees paid to collectors, like redemption centers. The overall net system cost is highly sensitive to the estimated handling fees. The study uses only one handling fee scenario, which is an average of 3.91-cents per unit redeemed.

Handling fees for other deposit programs in the U.S. range from zero cents to four cents, though the "4 cent" handling fees are only for a minority of containers in Vermont and Maine. (Commingled containers in VT and ME have a handling fee of 3.5 cents.) Otherwise, Vermont and Maine have handling fees of 3.5 cents. Iowa's handling fee is one cent per container. A handling fee of 3.91 cents would therefore be the highest in the country.

Handling fees in other U.S. states compensate redemption centers for the time-consuming practice of sorting beverage containers by brand, which is a requirement that does not exist in the proposed deposit refund system in this report for Minnesota. If the handling process is proposed to be simpler in Minnesota, then one would expect the handling fees to be lower than in other states, accordingly.

In California, handling fees have decreased twice over the past 5 years as container volumes have increased (which improves economies of scale at the redemption centers).

Also, more efficient operations are possible, and programs in Canada and the U.S. are innovating and reducing program costs. If the proposed system in Minnesota does not allow compaction, then the storage requirements at redemption centers will be much higher, which leads to increased size of the center, and increased rent costs for a larger space. The study envisions redemption centers that are 3,500 square feet. In contrast, many redemption centers in California are less than 1,000 square feet. Even after allowing for larger centers to allow indoor operations in Minnesota, there is an opportunity to scale down the centers, especially if some compaction of containers is allowed.

Handling fees needed to operate reverse vending machines (RVMs) generally falls between 2-cent and 1-cent, depending on the throughput of the machine.

Lastly, in a recent similar study by Resource Recycling Systems (RRS) entitled “Container Redemption System Optimization Study,” the study concludes that the collection and processing costs on average are: 1.1-cent/container for manual redemption centers; 1.7-cents for RVM retail locations; and 2-cents for redemption centers.

Compensation of a 3.0-cent average handling fee is probably more reasonable, although still likely too high. The lower handling fee will have a very significant impact, reducing annual program costs by \$33 million. (See Table 1.) This would bring net program costs to zero, and would eliminate the estimated cost of the 0.6-cents per beverage price increase. This is consistent with the findings of the recent RRS which reports: “At 10¢ the system is still profitable, however, if recovery rates are greater than 95% the system risks being unprofitable”<sup>1</sup>.

**Table 1: Total handling costs at 3.9-cents and 3.0-cents scenarios**

<b>Units Redeemed (millions)</b>	<b>HF</b>	<b>Total HFs in million \$</b>
3,604	\$0.0391	\$141
3,604	\$0.0300	\$108
<b>Net Difference</b>		<b>\$33</b>

Table 2 compares the Vermont program with the proposed Minnesota *Recycling Refund System*. In MN, it is estimated that each redemption center will collect more than double the volume of containers currently collected in Vermont redemption centers (on average). Given the more considerable economies of scale, it is reasonable to model a lower handling fee.

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<sup>1</sup> CONTAINER REDEMPTION SYSTEM OPTIMIZATION STUDY, Resource Recycling Systems (RRS), 2013

**Table 2. Minnesota Proposed Redemption Centers Compared to Vermont Existing Redemption Centers**

<b>Statistic</b>	<b>Vermont, Existing</b>	<b>Minnesota, Proposed</b>
<b>Population</b>	<b>.63M</b>	<b>5.4M</b>
Number of Redemption Centers	63	402
Number of Containers through Centers, total	242M	3,604M
Containers per redemption center	3.8M	<b>9</b>
<b>Number of Sorts</b>	over 40	<b>~20</b>
<b>Handling Fee</b>	<b>3.5-cents / 4-cents</b>	<b>3.9-cents</b>

**Recommendation: Include an alternate handling fee scenario (3-cents average) in the cost estimates, which account for system efficiencies like no brand sorting; reverse vending machines with compaction etc.**

**2. Projected program costs have very little recognition of potential synergies and efficiencies.**

The analysis in the report assumes all new redemption center sites and baling facilities. But according to the recent “working Paper number 2” from Recycling Reinvented, there is an abundance of available capacity at existing Material Recovery Facilities in the state. It would be logical to assume some of these in-state MRFs could serve as baling facilities. It’s also logical to assume that some existing small businesses in the state (convenience stores, for example) would choose to expand to become redemption centers, as we’ve seen in other states. Many of the waste haulers, recyclers and MRFs in the state could choose to operate redemption centers, and offer to provide baling services at their existing operational sites.

Capitalizing on the obvious synergies with the existing MRFs could significantly reduce any losses to MRFs, because they could continue to process many more of the same types of containers. These baling centers/MRFs can also play a key role in the tracking and verification of refunded containers, performing the auditing and anti-fraud procedures that have become best practices elsewhere.

There are also substantial opportunities to reduce transportation costs using in-center or on-truck crushing systems, which have been proven to reduce transportation requirements by as much as 40%. This was the experience in New Brunswick, Canada for example, when the program operator installed “Enviropactor” units in each of their collection trucks. These machines create “mini-bales” which can easily be broken open later and audited as part of the regular verification system.

**Recommendation: The proposed Recycling Refund System should be designed as “best in class.” The design of the program should be informed by the many innovative measures used in successful deposit return programs all over the world and, wherever possible, use existing capacity in Minnesota.**

**3. The potential cost savings to the ICI sector is not trivial, and should be estimated for this study.**

We have estimated these costs savings to be between \$1.8 million to over \$4 million per year based on different redemption rates and whether or not savings from recycling are included. The estimates provided in the table 2 below are based on the tons provided in the report table 4 & 5 for ICI generation and recycling of beverage containers.

Savings include avoided tip fees for disposal (valued at \$70/ton); recycling costs (valued at \$122/ton); and litter abatement (unknown). When litter abatement costs were estimated by KAB in 2009 it was estimated that the lion’s share of costs were to businesses that have to clean up parking lots, sidewalks and around storefronts.

**Table 3: Estimated costs and savings for IC&I sector**

<b>Collection Scenario</b>	<b>Estimated Disposal Costs (based on \$70/ton)</b>	<b>Estimated Recycling Costs (based on \$122/ton)</b>	<b>Estimated total Costs for IC&amp;I</b>	<b>Net savings from deposit return</b>
33% (status quo)	\$2,787,610	\$2,432,070	\$5,219,680	
77%	\$962,104	-	\$962,104	<b>\$4,257,576</b>
84%	\$669,290	-	\$669,290	<b>\$4,550,390</b>

***Recommendation: Include estimates for avoided costs to IC&I sector and add these savings in the total cost and benefits analysis.***

**4. Costs associated with number of redemption centers can be reduced and optimized by use of more sophisticated siting techniques.**

The study assumes that the system will require 402 redemption centers, with a minimum of one depot in each county, plus an additional redemption center for every 15,000 people. Siting locations for container redemption should primarily be driven by physical proximity (i.e., distance) to people rather than the number of people around the depot. For example, in Canada’s largest province, where a deposit-refund system is in place for all beer alcohol containers, 86% of the population of legal drinking age is located within a 5 minute drive from a redemption site.

In Minnesota, in the case of urban areas, redemption centers should be scaled in terms of size to serve a greater number of people, as long as they are within a close proximity. This would suggest fewer, but larger, redemption centers. In more rural areas, where people are used to driving longer distances to go grocery shopping, convenience proximities can be higher. In addition, mobile sites can be used to provide convenience to people in outlying areas, as has been done successfully in Hawaii. Fewer but equally convenient redemption will improve the economic effectiveness of each location and thereby reduce the overall need for a high handling fee.

**5. The benefit of surplus funds in the first few years of the program has been omitted from the analysis, but can play a major role in offsetting future costs and start-up education costs.**

Based on Hawaii’s experience, a new deposit program may take a few years to reach its target redemption rate. Hawaii’s redemption rate grew steadily in the first five years before reaching a plateau of 75% to 80%. Their rates were 61% in 2005, 68% in 2006, 68% in 2007, 72% in 2008, and 79% in 2009.

As a result, there will be more unredeemed deposit revenue collected in Minnesota, and less costs associated with collection, transport and processing, compared with the estimated annual long-term net costs. The potential surplus is substantial. Achieving an 84% redemption rate after two years post program implementation is reasonable, and would render a high amount of surplus funds. Consider the following example to help illustrate.

If the program achieves a 60% redemption rate in the first year, and a 70% redemption in the second year, the surplus revenue from avoided handling fees and increase unredeemed deposits is over \$220M million (Table 4). These funds can be used to create a program reserve; fund start-up education; and reduce future costs to beverage producers. For example, if all surplus funds were used to offset producers' costs, then the cost to producers would be zero for six years after the program achieved the 84% targeted maintains a \$50M reserve.

When earned interest at a conservative 1% per annum is considered, this generates an additional \$14 million in year 1 and \$22 million on the accumulated surplus after the end of year 2.

**Table 4: Surplus fund in the first two years of the program (scenario 60%; 70%)**

Program Year	Redemption Rate	Additional unredeemed revenue, millions	Avoided HFs, millions	Annual Surplus
1	60%	\$114	\$31	\$144
2	70%	\$67	\$13	\$79
<b>Accumulated Surplus after two years</b>				<b>\$223</b>

**Recommendation:** *Include as a benefit in the analysis any cost surplus revenue, which will be raised during the start-up years of the program, and the potential utilization of those funds.*

**6. The Kentucky CBER study isn't reliable for this purpose of estimating possible sales losses from the Recycling Refund System.**

The Kentucky study didn't study *actual* beverage sales or even actual grocery store sales. The Kentucky study used data on grocery store workers' wages, and used that as a proxy for grocery store sales.

**Correlation is not necessarily causation**

In the regression analysis, the study authors did not consider other factors that have an impact on worker wages, such as differences or changes in minimum wage laws from state to state, differences in unionization of grocery store workers from state to state, differences or changes in tax rates on food, differences or changes in excise taxes on alcohol, mechanization, or general economic development. Furthermore, the study did not publish or state the "R<sup>2</sup> value" that resulted from performing the regression analysis, so there is no way to gauge whether the correlation between grocery worker wages was a strong or weak correlation, or whether the measured difference was entirely due to other factors.

The Kentucky CBER study found that, over a 24-year period, grocery store wages in border counties in non-deposit states had increased 4.6% more than in border counties in deposit states (with no regard for any other differences that might have occurred in the economies of those various counties). This difference over 24 years equates to 0.2% less growth each year. That small of a difference in growth rates is well below the margin of error for any such measurement – it is simply too small to measure or predict with any accuracy. It is likely that such a slight difference is customary between any two counties, whether in

different states or not. Furthermore, by definition, it is a decrease in future growth, not a decrease in current sales. So it doesn't mean that the study predicted that current jobs would be lost. **It predicted that the future growth in jobs would be very slightly lower, as measured over a 24-year period.**

The use of data from "border counties" is also problematic. In Southern California, there are two extremely large counties, San Bernardino and Riverside counties, and both of these were included in the study. These two counties have a combined population of over 4 million – indeed, the population of each of these counties is larger than the entire populations of the States of Vermont and Maine, which are also included in the study. Yet these populations are in the western edges of these counties, nearly 200 miles from the border with Arizona. Surely these millions of residents do not shop at grocery stores in far-away Arizona.

***Recommendation: The discussion in the report related to lost grocer worker wages and subsequent assumed job losses should not be excluded from this analysis (as per discussion above). Instead, the report should consider all of the variables than can affect cross border sales (like different tax levels for example) to be more informative on the subject. The presentation of this discussion should be more qualitative than quantitative (meaning, no exact quantification of "job losses.") This approach is consistent with how the benefits of litter reductions were reported in this study.***

#### **7. Status quo recycling rate of 45% is likely overestimated because it does not account for mis-sorted material at MRFs and glass fines destined for disposal.**

Beverage container recovery from curbside recycling and recovery from container deposit programs are not comparable. Table 3 on page 7 estimates that the current beverage container recycling rate in Minnesota is 45%. A waste composition study was used to estimate disposal quantities, and recycling quantities were derived from the disposal and generation quantities. There was no allowance for the obvious fact that glass beverage bottles are typically broken en-route from the collection point to the disposal site. Indeed, that is exactly what the on-board compaction equipment is designed to do. Therefore, when it comes time to sort and weigh items in a waste composition study, much of the glass will already be broken and too small to study, or embedded in other items, leading to an underestimate of glass beverage container waste.

Furthermore, there has been no adjustment for losses from mis-sorting represented in these totals. There is always a portion of material that is improperly sorted in a MRF. Cans end up in paper bales, glass in plastic, plastic in cans, etc. In order to accurately estimate a recycling rate, losses during the sorting process should be accounted for. The weight of material recycled into a raw material to supplant virgin feedstock constitutes recycling, not contaminants destined for disposal.

Table 4 shows the rates in the report, and the actual recycling rates, which account for losses from mis-sorting which will be discarded further downstream, usually at glass processor, plastics reclaimer and aluminum smelter. This issue was studied extensively by the State of Oregon Department of Environmental Quality, in their report, "Composition of Commingled Recyclables Before and After Processing," March 2011. The estimates used in the table below are much more conservative than what was found in the Oregon study.

If 19% of the glass originally collected curbside ends up as fines at the glass beneficiator or other processing sites, then the weight of those fines should be subtracted from the total. The current beverage container recycling rate would drop to **40%**. If we deduct contamination for plastics and aluminum, the recycling rate drops to **37%**. (See Table 5.)

In contrast, recycling rates for the beverage container deposit program is reported on a unit basis, at 84%, and there is typically less than 2% contamination in deposit material.

**Table 5. Estimates of Recycling, After Accounting for Improper Sorting**

Container Type	Generation (tons)	Total Recycling tons	Total Recycling rate	Percent of collected containers that are mis-sorted at MRF*	Revised Total Actual Recycling	Revised Recycling Rate
PET Bottles	41,732	18,532	44%	16%	15,567	<b>37%</b>
HDPE Bottles	9,878	4,698	48%	16%	3,946	<b>40%</b>
Other Plastic	2,681	536	20%	16%	450	<b>17%</b>
Alum Cans	32,087	16,986	53%	15%	14,438	<b>45%</b>
Steel Cans	63	37	59%	n/a	37	<b>59%</b>
Glass Bottles	155,072	73,052	47%	19%	59,172	<b>38%</b>
Aseptic Gable	9,317	382	4%	n/a	382	<b>4%</b>
Foil Pouches	261	0	0%	n/a	-	<b>0%</b>
<b>TOTAL</b>	<b>251,091</b>	<b>114,223</b>	<b>45.5%</b>	<b>-</b>	<b>93,993</b>	<b>37%</b>

\*A conservative estimate based on claims from glass; plastic and aluminum processing industries.

**Recommendation: Add a new column, “Percent collected containers that are mis-sorted at MRF” to Table 3 of the report and re-calculate recycling rate. The entire benefits analysis should be based on the revised lower rate.**

**8. The report should consider the benefits of cleaner material collected from the Recycling Refund System and the benefits to the supply chain.**

There are many US glass, plastic and aluminum processors, converters and end-users that use collected recyclables. Each benefits from greater volumes of cleaner material. This means less energy expenses; less emissions; less wear and tear on equipment, less downtime; and greater yield rates. While these benefits are difficult to quantify, the report should provide some discussion at least, and list these qualitatively.

**Recommendation: The report should consider the benefits of cleaner material collected from the Recycling Refund System and the benefits to the supply chain.**

**9. Limited reporting on the costs and scope of impacts from beverage container litter**

We recognize that estimating a cost savings from litter reduction is challenging. However, it is worth at least presenting the results of some well-known studies, which do provide some context as to the size and scope of those costs and impacts.



For example, not only does litter cost a significant amount to collect and dispose of, (estimated to cost approximately \$10 billion in the US for litter pick-up<sup>2</sup>), but litter-related costs are also borne from storm drain clean up; damage to farming equipment and livestock, and the impacts from marine debris, which beverage containers comprise a significant share of.

Research from the UK<sup>3</sup> identifies and monetizes the “disamenity” associated with uncollected litter. The study found that the average householder would be willing to pay \$41 per year (25 pounds sterling) to live in a neighborhood where the streets are kept clean.

As a result of the financial incentive to recycle, deposit-return has reduced littering of beverage containers (metals cans, plastic, and glass bottles) by 70 to 80 percent, and total littering by 30 to 40 percent<sup>4</sup>. These benefits should not be taken lightly in the report and should be explored further.

***Recommendation: Expand the discussion in the report on the benefits of reduced litter from the Recycling Refund System. Present the results of some well-known studies that report on impacts of litter from all source points, not only public spaces.***

## 10. “Special trips”

We agree with RSE’s decision not to include an additional cost for “special trips” to redeem containers. Best in class deposit return programs, where convenient redemption is available to consumers, is unlikely to cost consumers more money. It is the consumer’s choice whether to make a special trip or combine it with other errands, and therefore any extra cost should not be part of the analysis, as they can ultimately be avoided. In 2013, VPIRG – Vermont Public Interest Research Group informally polled redemption center owners and they indicated that the vast majority (80-90%) of redeemers make purchases at their store or near the redemption center during the same trip. One redemption center owner tracked the purchasing habits of customers for an entire day and found that 92% made a purchase at the time of redemption, negating the claim that these were “special trips,” which leads to a very different conclusion than the DSM study. Furthermore, the sample size of the store owner’s records was far larger than the DSM sample size.

***Recommendation: Maintain the current methodology of excluding presumed "special trips" for redeeming container in the cost benefit analysis.***

Sincerely,



Susan V. Collins  
President

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<sup>2</sup> 2009 Visible Litter Survey and Litter Cost Study. Final Report, September 18, 2009. Prepared by MSW Consultants for Keep America Beautiful, Inc. Stamford, CT.

<sup>3</sup> Cambridge Economic Associates et al (2010) Development Work to Value the Impact of Regeneration, Technical Report: Environmental Quality and Amenity, May 2010

<sup>4</sup> Source1: Container Recycling Institute (CRI); Source2: Perchards (2005) Deposit Return Systems for Packaging