

The Impact of Changes in the Iowa Bottle Bill on Single Stream Recycling

Dermot Hayes
Iowa State University

Single stream recycling allows residents to place their newspapers, bottles, cans, boxes and other non-food recyclables into a single container that is then collected and sent to a specialized center where the materials are separated by mechanical means. It was introduced to improve residential recycling rates and to reduce recycling costs. It is in use in the Des Moines metro area as well as in Ames and the University of Iowa.

One draw-back of the system is that the final commodities will typically be contaminated relative to products collected via recycling centers or curb sorting. Glass poses a particular problem for this system because bottles often break during the collection and resorting process. Small pieces of glass can end up in paper pulp and this causes problems at paper mills. As a result of this breakage problem only 40% of the glass that enters the single stream system is recycled. The remainder ends up in landfills or as a contaminant in other materials¹. This contrasts with the 98% recovery rate for glass in container deposit systems.

Studies have shown that single stream increases the volume of recycled material by about 20% relative to other recycling systems. Costs of single stream are about the same as other recycling systems because the reduced material value due to contamination and the additional costs associated with sorting offset lower collection costs². Single stream essentially replaces higher variable costs associated with other collection systems with higher fixed costs due of the expensive sorting system. So the net benefit of the system is the increase in the volume of material that is recycled.

The cost of single stream recycling systems depends on the degree of contamination. An 2008 study in Ontario found that single stream costs of almost \$140 Canadian per ton³. Cost so single stream in Iowa are estimated at \$63.50 per ton. This cost is low in part because of the Iowa Bottle Bill. This increased the return rate for beverage containers from 26% to 86%. Return rates for glass containers in Iowa are an impressive 92% and only 1.5% of the solid waste in Iowa now consists of glass⁴. In a study I did on the Iowa Bottle Bill last year, I estimated that 56,750 tons of glass bottles were recycled in Iowa each year. This recycled glass reduced total trash collection from 2.92 million tons to 2.86 million tons to a 1.96% reduction.

Impact of Eliminating the Bottle Bill

Based on the study I did last year the elimination of the bottle bill would cause glass bottle collection rates to fall from 92% to 26% then approximately 37,455 tons of bottles

¹ See <http://www.container-recycling.org/assets/pdfs/reports/2009-SingleStream.pdf>

² See Eureka Recycling, A Comparative Analysis of Applied Recycling Collection Methods in St. Paul, May 2002, or Lantz, Daniel, Mixed Residuals, Resource Recycling, December 2008

³ See figure 3 in <http://www.container-recycling.org/assets/pdfs/reports/2009-SingleStream.pdf>

⁴ Iowa Statewide Waste Characterization Study Prepared for the Iowa by MSW Consultants September 14, 2011

will be disposed of via garbage or single stream systems. Of the portion that enters the single stream system only 40% will be recycled.

Faced with a dramatic increase in glass contamination the single stream operators will see a decline in the net value of the materials they process. The value of paper pulp in particular will decline and pulp mills might begin to reject the product.

The cost estimates provided below are based on a study conducted in 2011 by an Iowa based single stream operator. This operator process about 26,000 tons of collected materials and processes these at a cost of \$63.50 per ton. They estimate that their costs will increase by \$16.5 per ton due to this contamination. Based on the population served by this operator, an additional 6,367 tons of glass will enter the stream and 2,546 tons will be recycled. An equal amount of glass will enter the landfill. Total costs will increase by \$534,055.

Impact of Expanding the Bottle Bill to all Beverage Containers

The Iowa Bottle Bill excludes containers used for non-carbonated soft drinks, sports drinks, and water. In the report I did last year I estimated that if the \$0.05 deposit was extended to these containers the recovery rate on these containers would increase from 26% today to 76%. On a statewide basis tons of recycled plastic would increase from 10,375 to 25,113. The single stream operator who provided the cost estimated would experience a reduction of 2,505 tons of plastic collections. Removing the plastic would reduce the level of contamination and total costs would fall slightly to \$58 per ton after allowing for reduced sales of PETE.

This company has already made large fixed costs investments to accommodate the plastic it collects and removes and these costs will not change as the number of tons falls. Therefore it would not be correct to reduce total costs in proportion to the reduction in the number of tons collected. If we hold total costs constant but allow for the minor reduction in cost per ton due to the increase in the value of the tons sold then costs would fall by \$46,990