

# RETURNING TO WORK

**WORKERS ARE NEEDED IN LANDFILLING, CURBSIDE RECYCLING AND CONTAINER DEPOSIT RETURN, BUT WHICH SECTOR BRINGS THE MOST MUCH-NEEDED JOBS TO THE STRUGGLING U.S. ECONOMY? OUR AUTHORS PROVIDE A DETAILED ANALYSIS OF THE POSITIVE IMPACT BEVERAGE CONTAINER DEPOSIT PROGRAMS CAN HAVE ON JOB CREATION.**  
**BY CLARISSA MORAWSKI AND JEFF MORRIS**

**W**ith less than a year to go before the U.S. election, Democrats and Republicans seem more divided than ever on the issues facing the nation. But the one thing that does seem to unite all Americans, left or right, is the shared goal of getting people to return to work. The domestic jobs increases associated with waste diversion instead of disposal have been examined in a number of recent studies by a variety of sources, including the Institute for Local Self-Reliance; Pricewaterhouse Coopers in Germany; Eunomia in England; and the Institute of Scrap Industries, Inc. Last month, the Tellus Institute prepared a report, which was released to much fanfare (see page 52 of this magazine for more) that found a 75-percent diversion rate would produce 1.5 million jobs and provide a tremendous boost to the U.S. economy.

They all report a significant increase in jobs from greater levels of recycling. From wood waste recycling, to tire crumbing, or turning broken glass into new glass bottles, recycling is both good business and creates jobs. *Resource Recycling's* lead story from this past summer (*Recycling = Jobs*, July 2011) revealed convincing statistics from the U.S. Department of Labor that show robust growth for the recyclable materials industry. Since 2005, the number of people employed in this sector rose by eight percent and during the 10-year period ending 2007, sales rose by nearly 50 percent.

Effectively, the business of resource extraction (mining and oil drilling) and material conversion is transferred “above ground” to where recyclables are collected, transported, processed and converted (secondary process). Equipment and energy costs for resource extraction are replaced by the labor costs associated with resource recovery.

## Measuring domestic jobs impacts from recycling

Understanding what these jobs impacts are, at each and every stage of extraction or recovery, is what guided new research just released by the Container Recycling Institute (CRI). “*Returning to Work: Understanding the Jobs Impacts From Different Methods of Recycling Beverage Containers*” reports the net gains in full-time-equivalent (FTE) domestic jobs when beverage containers are recovered through various waste management schemes.

The findings include a new excel-based jobs model, *Measuring the Impact from Recycling on Jobs Calculator* or “MIRJCalc,” which was created by Jeffrey Morris, Sound Resource Management Group with research and analysis from Clarissa Morawski, CM Consulting.

The team set out to quantify, in terms of net impact on domestic jobs, the number of FTE jobs associated with every 1,000 tons of

beverage container material recovered and recycled. Materials included in the study were beverage containers sold in the U.S., made from aluminum, glass and PET. Collectively, these represent over 220 billion units available for recycling each year, weighing over 1.5 million tons of aluminum, 9.6 million tons of glass, and 2.7 million tons of PET.

Three different materials management schemes were analyzed: container deposit return (CDR); residential curbside recycling; and disposal. For each option, the research team figuratively “traveled” along the same path that all three materials will travel and identified how many jobs are directly associated with the tonnage throughput along the way.

For example, in the case of glass recovery, there are jobs associated with collection, transportation, processing in a material recovery facility (MRF), more transportation and glass beneficiation (secondary processing or “conversion”). Jobs were counted along the way until the material gets shipped to a product manufacturer. Jobs in manufacturing were excluded because it is confirmed that in most cases irrespective of whether the raw material is virgin or recovered (secondary), the impact on manufacturing jobs is neutral. In addition, if material like PET is exported overseas, counting jobs stops. Lastly, if any material is lost along the way as “residual” during processing, the counting shifts to the number of jobs associated with disposal of the material.

The research also attempts to quantify job losses that may occur upstream during virgin material extraction when recovered material substitutes for virgin. Extracting raw materials for use in glass bottles, fiberglass and aggregates for example, includes mining for silica, soda ash, aplite, limestone and borates. The raw material “recipes” per ton of manufactured product were provided by manufacturers.

Beverage container throughput (in tons) is based on average recovery rates for state-based CDR systems; residential curbside recycling and enhanced curbside, which includes recycling of containers generated away-from-home, as well as recycling of containers generated by multi-family residents and single-family households without access to curbside (households required to self-haul to a recycling depot).

## User inputs

Users of MIRJCalc input name of the state, and several primary variables which have a measurable impact on amount of beverage container recovered (e.g., the amount of tonnage to run through the model). The model incorporates state-specific data, such as population; single-family versus multi-family share of households; and beverage sales by type.

For example, in the CDR scenario, the user identifies the deposit level (a 5-, 10- or 15-cent deposit) which specifies the average performance rate of 75 percent, 85 percent and 95 percent collection, respectively. Users may also enter another recovery rate if they choose to. For the non-CDR scenario, users are asked to provide the percent of eligible households with curbside collection service.

For other important variables, defaults are provided which represent average rates in the U.S. For example, for non-CDR recovery, default capture rates are provided for glass, PET and aluminum containers from single- and multi-residential generators with collection services, away-from-home and self-haul recycling. In addition, the proportion of manual versus automated curbside collection is

Figure 1 | Jobs created (U.S.) from beverage container recycling

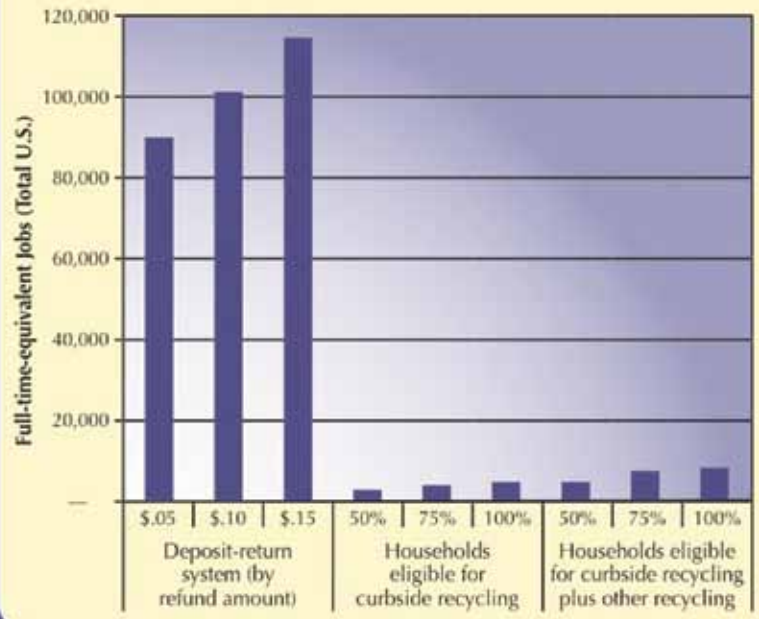
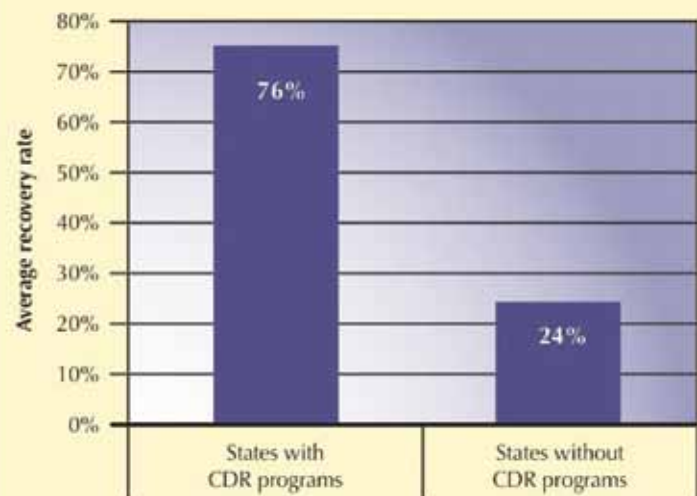


Figure 2 | Recovery rates for beverage containers in CDR vs non-CDR programs



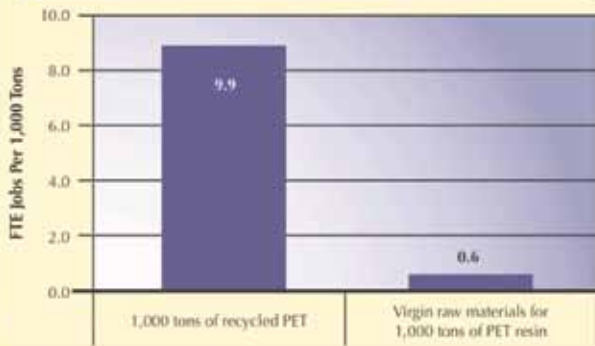
also assumed at 23 percent and 77 percent, respectively. Users may change the default to better reflect the situation in their state.

Defaults also exist for both CDR and non-CDR options, relating to the export rate for PET, as well as yield loss rates for glass, PET and aluminum. These loss rates are based on reports from the secondary processing industry and represent actual experience with both curbside and CDR streams of material.

## The final results

The analysis provides a compelling case for increasing recovery rates and maintaining high-quality glass, PET and aluminum recovered

**Figure 3 | Jobs created in recovering PET vs producing virgin raw materials for PET resin**



materials. Maximizing recovery rates ensures the greatest volume of containers moves through each recovery stage and gains the associated domestic jobs. In addition, maintaining high-quality material results in the least amount of yield loss (contamination) to disposal, where there are fewer jobs, ton for ton.

The following provides a summary of findings based on a set of default inputs which are reflective of status quo rates in the U.S. today. While the model is designed for a state-by-state analysis, the results below are for the entire country.

Using deposit return as a means of collecting beverage containers instead of a curbside recycling program creates more jobs. Using primary system parameters as the base scenario (5-, 10-, or 15-cent refund value in a CDR system, and 50-, 75- or 100-per-

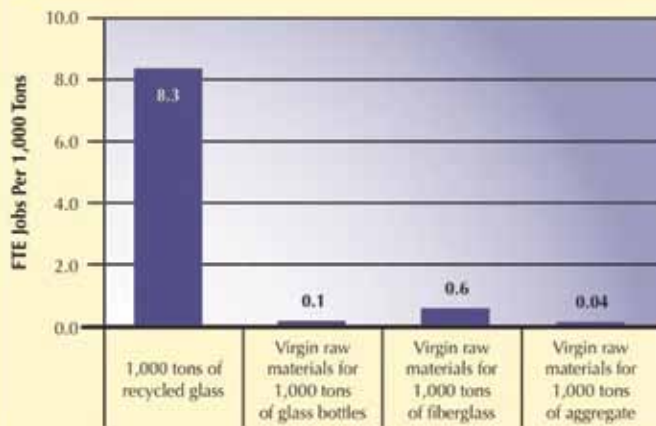
***Beverage container deposit systems provide 11 to 38 times more direct jobs than curbside recycling systems for beverage containers.***

cent curbside eligibility for a non-CDR system), deposit-return systems create significantly more jobs. (See Figure 1).

The primary driver of direct jobs from recovery operations is the amount of material (“throughput”) entering and leaving the system. Deposit-return systems recover approximately three times more beverage container material than the closest competitor, curbside recycling. Specifically, in the U.S., deposit-return systems recover approximately 76 percent of all beverage containers covered by deposit laws, compared to approximately 24 percent of beverage containers collected through curbside programs and other methods (see Figure 2).

The secondary driver of direct jobs in container recycling systems relates to the number of workers needed to collect and sort the containers and transport them to the MRF or secondary processor. Deposit-return systems require 1.5 to 4.0 times as many employees for these tasks as do curbside systems. Specifically, approximately 7.34 FTEs are required per 1,000 tons of material collected in a deposit-return system, compared to 4.46 FTEs in a manual curbside system and 1.66 FTEs in an automated curbside system.

**Figure 4 | Jobs created in recovering glass vs extracting virgin raw materials for glass**



Replacing virgin material with secondary materials in manufacturing recycled-content products may displace some domestic jobs in mining, oil extraction, polymerization and other virgin material extraction industries. However, extraction industries tend to be more machine intensive than labor intensive (see Figures 3 and 4). As such, the net employment impact favors jobs in recovery industries.

**Moving from the micro to the macro**

The analysis is a micro look at the impact of recycling materials through various collection mechanisms, and presents only a portion of the benefits related to job creation. These are the direct jobs only. Excluded are all of the job increases that arise from businesses in the region that supply goods and services to the recycling business (“indirect jobs”).

In addition, businesses that provide goods and services to the individuals with the direct jobs also create additional new jobs (“induced jobs”). And then there are the induced jobs from the indirect jobs, and on and on. Both indirect and induced effects will have a multiplier effect on the direct jobs from recycling, which further emphasize the benefits of increasing recycling in the U.S.

While MIRJCalc treats the domestic manufacturing jobs as neutral, the report recognizes that for many U.S. consumer-products manufacturers who use recycled container material in everything from bottles and fleece to fiberglass, they do so to reduce energy use, emissions and other pollution, reduce production costs and meet internal or industry sustainability goals.

Increasing the quantity and quality of recovered glass containers available for beneficiation, for example, can increase the amount of high-value, furnace-ready cullet for bottle manufacturing and decrease the amount sent to landfill as residual.

Superior performance rates for recovered quantities and improved quality of material is consistently higher in CDR versus curbside collection systems. In fact, glass manufacturers report a strong correlation between their level of cullet use and the availability of cullet from states with CDR programs. Specifically, one large bottle glass manufacturer with facilities throughout the U.S. reports average recycled-content rates of 72 percent in CDR states;


24 percent in states that border CDR states; and 12 percent in non-CDR states.

Similarly, increasing the recovery of high-quality PET bottles is paramount to the domestic reclamation industry. In 2009, about 41 percent of U.S. PET processing capacity sat idle, while 56 percent of all bottles recovered (primarily those from curbside programs) were shipped overseas. This represents another 400,000 tons of material that could potentially generate 800 new direct jobs in PET reclamation alone, and many more indirect and induced jobs.

Last spring, *Plastics News* reported that while domestic capacity expansion in the last two years totaled some \$350 million in investments, there would have been further expansions had it not been for the fact that “tight supplies have caused some PET capacity expansions to be cancelled or delayed.” Such market dynamics illustrate the economic opportunity and increased jobs available when greater quantities of high quality material are recovered.

The analysis reveals stage by stage how recovering materials for recycling stimulates job growth. And, while the scope of materials

is limited to only three types of beverage containers, and direct jobs only, it provides helpful insight around setting priorities for federal and state recycling policy.

A strategy which targets very high collection rates, material by material, and ensures recyclables can be converted domestically, will not only increase jobs involved in collection, transport and processing, but support U.S. manufacturing as well. This is the “restoration of economic growth” that needs no federal stimulus dollars. 

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