SEPTEMBER 2019

TRASHED

HOW CALIFORNIA RECYCLING FAILED AND HOW TO FIX IT

by Liza Tucker

Consumer Watchdog

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Consumer Watchdog California Recycling Study

Trashed: How California Recycling Failed And How To Fix It

EXECUTIVE SUMMARY

The California bottle deposit law was designed to recycle billions of empty glass, plastic and metal beverage containers every year, cut pollution, and save energy. Today, Consumer Watchdog finds that the California bottle deposit system is imploding and about to collapse without immediate and fundamental reform.

OVERVIEW OF PROBLEM

- Redemption centers are closing at an alarming rate and consumers are unable to get back their $1.5 billion worth of nickel and dime deposits they pay each year.
- Lack of access to redemption centers has increased unclaimed deposits to approximately $360 million. Beverage distributors, retailers, and waste haulers further siphon off hundreds of millions of dollars that should go to consumers.
- Increased contamination of the waste stream by curbside waste haulers has foreign markets for our recycling materials shutting their doors.
- Supermarket chains and other beverage retailers legally obligated to be recyclers of last resort are refusing to do so.
- The state regulator, CalRecycle, is ineffective, and has actually given retailers more than 1,200 exemptions from recycling responsibilities in the last several decades.

Waste haulers are cashing in on hundreds of millions of dollars-worth of consumer deposits annually for picking up these empties, contaminating them at high rates, and then collecting separate fees from government entities for landfilling and incineration.

Unlike in other states and countries, the beverage industry has never been made to take responsibility for the end-of-life of the beverage containers they make, distribute, and sell to the public. Instead, the financial responsibility has fallen onto consumers. California recycling is now simply recycling consumer deposit money into waste hauler profits.

OVERVIEW OF SOLUTIONS

Based on a review of successful bottle deposit systems in the U.S. and other countries, the California system should be overhauled to have:

1. Higher deposits;
2. Convenient, automated refund systems;
3. Increased consumer education; and,
4. The ultimate responsibility for recycling beverage containers to shift from consumers and onto the industry responsible for their creation, distribution and sale.

Key Findings

THE PROBLEM

California's bottle and can recycling program was once the envy of the world. Today it has become a failed model.

The recycling rate for empty plastic, glass, and aluminum beverage containers has fallen from 85% to 75%. The redemption rate is a mere 66%. Consumers only get back about 50% of their own nickels and dimes that totaled $1.5 billion last year with surrogates collecting the rest of their deposits.[1]

The culprit is "single stream" recycling used by consumers as redemption centers in economic crisis close. One in four items thrown into single recycling bins are not recyclable or are contaminated with food or other waste.[2] Pickup trucks smash and compact the contents, lacing loads with dirty glass shards and other contaminants. Industry analysts report that recycling facilities are routinely seeing contamination rates as high as 35%, condemning the material to landfills or incinerators.[3]

Successful recycling in the rest of the world is based on consumer convenience and returning cans to the point of purchase using modern automation such as Reverse Vending Machines. Consumers feed empties into the machines that sort them and get store credit or cash back. Models that work make beverage and retail companies that produce, deliver, and sell their products responsible for the recycling of their packaging. That incentivizes them to make the packaging more recyclable in the first place.

California has not learned that lesson, largely due to the political power of soda, beer and other beverage makers, distributors and retailers in Sacramento, that want no added burdens. Many retailers that are statutorily obligated to redeem containers in-store refuse to do so. Their resistance is aided and abetted by waste haulers that rake in exorbitant government subsidies for increasingly contaminated loads. No other state uses funds from its bottle deposit program to make millions of dollars in "supplemental payments" to

operators of curbside and drop-off recycling programs just for being there. No other state pays them for associated recycling costs plus allows them to collect consumer deposit money on top.

In 2017, haulers operating recycling programs wound up getting paid $170 million by the state for container recycling. But they recycled only 12% of the containers in the program, according to analysis of CalRecycle data by the nonprofit Container Recycling Institute (CRI).[4] Redemption centers, however, were paid only $155 million for handling 88% of the containers.[5] Waste haulers got paid ten percent more than redemption centers did overall for recycling a fraction of the empties.

Increased consolidation in the waste hauling business has put four garbage haulers in charge of 50% of the national market for waste hauling, and 75% of the permitted landfill capacity in major metropolitan areas, according to the Institute for Local Self-Reliance. They also now own half of the Material Recovery Facilities (MRFs) in the U.S. that extract and sell recyclable materials.

Letting these companies control recycling is a conflict of interest. "The key takeaway is that a critical activity such as recycling in U.S. cities should not be entrusted to consolidated companies whose main business is landfilling and incinerating garbage,"

according to the Institute For Local Self-Reliance.[6] "This is an obvious conflict of interest that has been the focus of attention in the grassroots recycling movement for quite a while."

As *The New York Times* writes, "Some municipal leaders are growing wary of companies that control virtually every aspect of the waste and recycling system while constantly raising prices. 'Are these rates truly high, or is it about benefiting their corporate interest?' asked Mike Ryan, the mayor of Sunrise, Fla. 'We can't afford to have inspectors constantly looking over their shoulders."[7]

SOLUTIONS

The Mercury News opined in an editorial, "It's time to shift the cost and recycling burden. **The nine other states with redeemable deposit programs haven't seen the same decline in recycling rates as California, according to a 2017 report from the state Legislative Analyst's Office.[8] That's in part because beverage distributors play a more significant role in those states and are responsible for most of the recycling cost."**

Other states and countries place a shared responsibility for end-of-life product management on producers and all entities involved in the product chain, instead of onto the general public only. Known as "Extended Producer Responsibility," or "EPR" programs, this policy encourages product design changes that minimize negative impacts on human health and the environment at every stage of the product's lifecycle, according to CalRecycle, the state's recycling regulator.

In fact, CalRecycle commissioned a study on how to restructure the deposit system a decade ago. The 2009 report, by the Sacramento-based R3 consulting group, and CM Consulting of Ontario, Canada compared bottle deposit programs in British Columbia, Ontario, and Germany to California's.[9] The report found such programs were driving successful beverage container packaging redesign, recycling and program innovation in Canada and Europe.

"There seems to be a consensus evolving in North America that good EPR programs are results-based rather than highly prescriptive," the report stated. "In other words, the government's role is to set performance standards in the public interest (with stakeholder input), and then step aside and let producers design and operate effective programs to recover their products. Then, government's role is to ensure transparency and accountability for outcomes."

As the R3 report pointed out, the three most important elements to successful bottle deposit programs are the amount of the deposit, consumer education, and wide access to redemption. Higher redemption rates are directly linked to higher deposits and to

consumer convenience. Yet, California's system is the most inconvenient out of more than 50 beverage container recycling programs around the world.

In California—unlike eight out of nine other states with bottle deposit programs—beverage retailers from grocery chains to big box, convenience and drugstore chains, are not required to take back empties alongside redemption centers.[10] The 1986 California law obligated retailers to be recyclers of last resort if redemption centers failed to materialize or closed. Now that redemption centers are closing, the majority of retailers are refusing to fulfill those responsibilities.[11]

Returning empties right to the store where you do your shopping dramatically increases consumer convenience. Seven other states and the vast majority of other programs worldwide mandate redemption at *both* stores and redemption centers.

In the eighth state of Michigan, consumers have only one way to redeem—retail stores that sell beverages. Residents there redeem 89% of the beverage containers they buy, a high redemption rate spurred by higher deposits and ease of access to deposit refunds. Michigan also prohibits beverage containers from disposal in a landfill. Beverage containers must be placed in recycling bins, taken to a recycling center, or redeemed for deposit at a store—but are banned from trash cans.[12]

Oregon and Michigan also put responsibility onto the beverage industry to run the program. In Oregon, an industry consortium is responsible for running and financing the bottle redemption program and retains unclaimed deposits, while the system is overseen by the state. In Michigan, where the state also oversees the program, three quarters of unclaimed deposits fund state environmental programs and retailers and distributors cover operating costs and retain the rest.[13]

In California, unredeemed deposits go into a special state fund—the Beverage Container Recycling Fund. That larder has been raided and then replenished in the past to sop up budgetary red ink for other programs.[14] Redemption centers are underpaid and retailers get no subsidies for taking containers back in store. The legislature is in charge of an ossified system of state payments to redemption centers scrambling to make a profit off the scrap in a volatile world market.

In every state with a bottle deposit program, except California and Hawaii, the beverage industry owns and markets the scrap. This nimbler approach gives the industry a bigger incentive to efficiently run a redemption system producing clean, marketable material, and gives them more market leverage to compete on scrap pricing.

GERMANY

German consumers pay a high deposit to incentivize beverage container recycling. The deposits on "single use" bottles and cans are up to 28 cents. Consumers redeem deposits at supermarkets and other retailers where they bought them. The collection system is 80% automated via Reverse Vending Machines.[15] Retailers and the beverage industry bear the costs of the system and are allowed to keep any unclaimed deposits. The rate of redemption is 96% for aluminum cans and 98.5% for PET plastic.

The United States landfills 69% of all of its municipal solid waste compared to Europe, which landfills on average 38%. But in Germany, one of several countries to drastically reduce landfilling, there will be no active landfills as of 2020. In the 1970s, that country had 50,000 landfills. Today, less than 300 exist.[16] German companies will not pick up unsorted garbage and consumers can be fined for improper sorting of recyclables.

NORWAY

Norwegians have a similar system. An industry consortium also runs the bottle recycling system. Consumers can return empties at 15,000 redemption locations with 95% automation. "We want to get to the point where people realize they are buying the product but just borrowing the packaging," Kjell Olav Maldum, CEO of Infinitum, told The Guardian.[17] Norway sets a high target for recycling and uses taxation to make sure that target is met. The closer industry gets, the less environmental tax it pays. The consortium has managed to avoid the tax for years by meeting or surpassing the target.

Making the beverage industry responsible for bottle recycling, while setting and enforcing recycling targets, incentivizes the industry to create efficient systems that put consumer convenience front and center.

LITHUANIA

In Lithuania, retailers with Reverse Vending Machines (RVMs) are paid a higher fee for handling empties than retailers without them. Consumers are refunded their deposit as vouchers that can be redeemed in-store as cash, credited towards their shopping bill or donated. Retailers find that boosts revenue by bringing in additional foot traffic. One national supermarket chain installed approximately 200 RVMs and watched as business grew with customers using their deposits to buy new products. Laurynas Vilimas, Managing Director of the Lithuanian Retailers Association, said: "I can say with absolute confidence the deposit return scheme was the right thing to do."[18]

Another advantage of the machines is that automation cuts down on the time it takes to redeem empties while collecting a stream of clean recyclables sorted automatically by the machines. Virtually all bottle deposit systems around the world, except for California and many Canadian provinces, have barcode-based recording systems that can identify whether containers qualify for redemption.[19]

The key factors that make bottle deposit systems in other countries successful are the degree of consumer convenience offered, the education of consumers, and the deposit amount. In Europe and states such as Oregon and Michigan, consumers can return empties to stores where they bought them and, in Oregon, also have access to redemption centers. Deposits are higher and consumers are better educated on the deposit systems.

The beverage industry in California has fought tooth and nail against taking empties back in-store, nixing that prospect in the bud when they lobbied on the decades-old state bottle deposit law, despite having staff, warehouse space, truck fleets, and the capacity to deliver empties to processors. They have managed to restrict consumer access to bottle redemption. Yet, retailers in other states and countries are perfectly capable, indeed well-positioned, to team up with the beverage making industry to create very convenient and cost-effective consumer return systems and increase their own grocery sales at the same time. In California, they may not welcome the shift, but they can certainly do it. What is lacking is the political will to reform the program to make them.

How We Got Here

In the 1990s, in response to new recycling laws, waste haulers invented single-stream recycling which started displacing predominantly dual-stream systems. Consumers had

commonly separated paper and cardboard from plastic, glass and metal containers. Consumers were led to believe that everything in the bin, or even in the trashcan, was being recycled, when it wasn't. The waste industry grew its profits by cutting costs on labor and delivery time. They no longer had to empty more than one recycling bin or use trucks with multiple compartments.

"Single-stream recycling facilities are like trying to unscramble an egg."

"When we switched to single-stream, recycling became this sort of feel-good, ridiculous thing that eventually reached the point where recycling companies told people, 'Well, if you're not sure, just throw it in the bin and someone else will take care of it,'" according to Justin Stockdale, regional director of the Pennsylvania Resource Council.[20] "Single-stream recycling facilities are like trying to unscramble an egg, which no one has so far figured out how to do. You can never get things 100 percent clean in a single-stream plant, and therein lies the root of the problem."

The waste industry promoted the idea that any increase in contamination would be offset by the increased volumes of recycled materials if consumers did not need to sort them first. It hasn't worked out that way. Contamination rates can cancel out any benefit from collecting larger quantities of recyclable materials. A 2002 study in Minnesota compared five different methods of recycling collection in St. Paul and found single-stream recycling increased tonnage collected compared to multi-sort systems. But it decreased the tonnage leaving the sorting facility ready for recycling. Single-stream systems also cost more to operate because of the increased cost of the sorting technology and the lower quality of marketed recyclables.[21]

"There is significant evidence that the resulting scrap material quality (and hence the revenue) is lower under single-stream collection than it is under a dual-stream system or under systems like container deposits, where materials are kept separate," according to CRI.[22] "There is particular concern that glass shards and PET [Polyethylene terephthalate] bottles can contaminate paper loads and wreak havoc in a paper mill, and that glass, plastic and aluminum containers cross-contaminate each other."

Material Recovery Facilities use a combination of workers and technology to sort material and companies have to protect both. Unrecyclable plastic bags, for example, can wrap around equipment parts and wreak havoc. Workers have to be kept safe from dangerous items such as medical sharps and chemicals, and from glass or plastic shards that can become deadly projectiles when run through machinery. Manufacturers who buy processed material to make into new products are rejecting more offerings after finding

that they have to divert larger amounts of substandard scrap. They have to pay to landfill what is unusable and then they have to buy clean substitutes, a losing proposition.

According to Aimee Lee from the nonprofit Recycle Across America, hand sorting by consumers "would save the billions of dollars currently spent to remove contaminants from the recycling stream.[23] There would be fewer plastic bags and other contaminants jamming the processing equipment. There would be significantly less wasted time and money spent while equipment is shut down for repairs, and far fewer injuries to the employees at recycling plants. If we eliminate confusion at the bin, these costly inefficiencies would be remedied, and the demand for the materials would be strong."

Bottle deposit programs are an example of that hand-sorting. Glass processors report that 60% of glass coming from single-stream programs is usable for making into glass bottles or fiberglass, according to CRI.[24] Another 19% is glass fines—small bits—that can be used as road base or landfill cover, but another 21% is mixed with contaminated non-glass residue and must go straight to a landfill. In contrast, 90% of the glass that comes from dual-stream programs that divert it from other materials can become new containers or fiberglass. The other ten percent can be used for low-end applications. Bottle deposit programs deliver color-sorted glass, resulting in 98% being recycled into high-end applications.

The only industrial sector that benefits from single-stream recycling is waste hauling. Haulers hold lucrative waste and disposal contracts and keep more of the profit via single-stream collection because it cuts down on truck staffing, loading, and delivery time. Whether more waste goes to landfills or incinerators doesn't matter as that revenue goes into their pockets too.

How Waste Haulers Help Themselves

According to CalRecycle, the state's recycling regulator, in order for California to reach a statewide recycling rate for solid municipal waste of 75% by 2020, more than half of the solid waste currently disposed would need to be recycled, composted, or reduced at the source. Overall recycling rates for solid waste have fallen in California from a peak of 50% in 2012 to 42% in 2017.[25] That still beats estimates of 30% nationally.[26] But Californians are generating more and more trash. Since 2012, trash disposal has increased per resident from 5.3 pounds to 6 pounds every day.[27] That amounts to the weight of a subcompact car per person per year.

The state's beverage container recycling program, intended to separate empties from the overall waste stream, once surpassed the state's 80% target for empty containers to reach 85%, but has officially fallen over the last several years to 75%. But the redemption rate

for consumers is a mere 66% because operators of consumer curbside drop-off programs that take the same recyclables are also paid consumer deposits.[28] Beverage container recycling rates where containers are diverted from the overall waste stream beat that of the total solid waste stream, but they could be even higher if skewed financial incentives were readjusted.

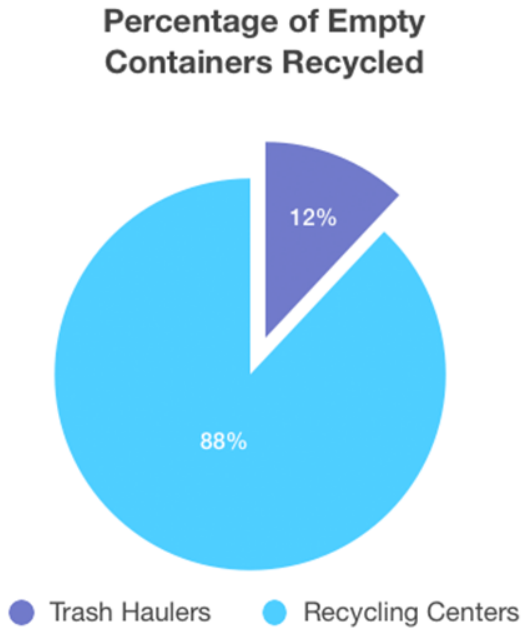
Operators of curbside and drop-off programs, including private and municipal waste haulers, benefit from the redemption of containers that consumers throw into the trash or single-stream bins, in addition to collecting millions of dollars in state subsidies that have not been proven to increase the quality of recyclable materials. These operators take in 12% of the beverage containers in the recycling program, while shrinking numbers of recycling centers take in 88%, according to CRI's analysis of CalRecycle data.[29] But overall, operators get ten percent more state revenue for handling most of the empties.

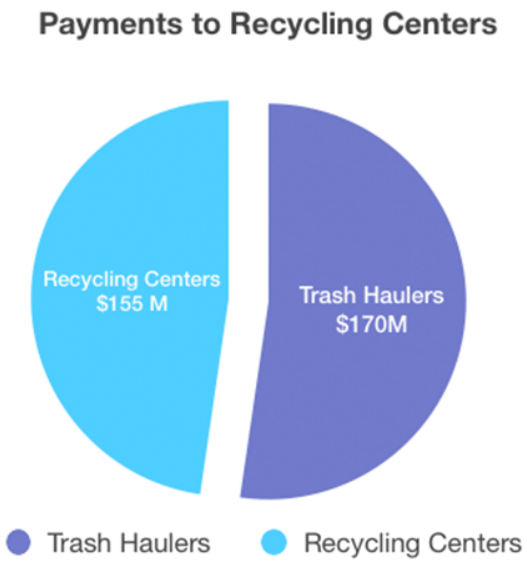
No other state uses funds from its bottle deposit program to make millions of dollars in "supplemental payments" to operators of curbside and drop-off recycling programs just for existing. No other state pays them for associated recycling costs plus allows them to collect consumer deposit money on top. California is unique for paying waste haulers twice for curbside recycling—via lucrative municipal contracts and via outsized state payments. Whether more waste goes to landfills or incinerators doesn't matter as that revenue goes into their pockets too.

"California is unique for paying waste haulers twice for curbside recycling"

In fact, operators of curbside and drop-off programs in California made gross profits of $170 million in 2017, or a 326% profit, according to CRI. But CRI estimates that recycling centers that redeem containers were shorted by $42.7 million between 2013 and 2016 by the state.[30] These centers have only the risky market to rely on to generate revenue from scrap in addition to state payments. But waste management companies also generate impressive profits from their own hauling, landfilling and incineration services in addition to scrap sales. Waste Management reported a record-setting year with total national revenues of $15 billion and operating profits of more than $4 billion for 2018.[31]

Increased consolidation in the waste hauling business has put four garbage haulers in charge of 50% of the national market for waste hauling, and 75% of the permitted landfill capacity in major metropolitan areas, according to the Institute for Local Self-Reliance.[32] They also own and operate half the Material Recovery Facilities (MRFs) in the United States. Those four companies are Waste Management, Republic Services, Waste Connections and Advanced Disposal.





Three of them—Waste Management, Republic Services, and Waste Connections—operate in California and have contributed a total of $3.9 million between 2013 and 2019 to local and state political campaigns, committees, measures and associations, according to filings with the California Secretary of State. Republic contributed $2.3 million of that sum, while Waste Management contributed $1.4 million.

Letting these companies control recycling is a conflict of interest. "The key takeaway is that a critical activity such as recycling in U.S. cities should not be entrusted to consolidated companies whose main business is landfilling and incinerating garbage," according to the Institute for Self-Reliance.[33] "This is an obvious conflict of interest that has been the focus of attention in the grassroots recycling movement for quite a while."

These companies charge higher service fees for garbage collection and spend less on disposal through volume consolidation. They fight to keep waste volumes large, according to the Institute, "by displaying how recycling doesn't work: The public can't be trained, the markets are unreliable, the processing costs too much, and more excuses, displaying their lack of interest in recycling. Any threat to market share of waste volumes is a direct threat to their bottom line and their value to stockholders, which is necessary to obtain capital for further consolidation of the industry."

Waste haulers have long offered recycling services to help win and keep lucrative municipal garbage contracts. But trash companies' main business is landfilling and

incinerating garbage. In some California communities, such as South Pasadena, all recyclables simply go into the trash and are sorted at 'dirty' Materials Recovery Facilities (MRFs) where contamination rates are higher than in single-stream systems. StopWaste.org, in Alameda County, calculated that the average recovery rate for such facilities in California is 19% compared to 85% at the best MRF. Though such mixed waste facilities today make up less than five percent of all MRFs, some California towns still use the method.[34]

Today, the virtual closing of China's market because of the U.S.'s high rates of scrap contamination has these giant haulers jacking rates for their recycling services, but it is unclear how much of recyclables that they collect go straight to landfills or incinerators instead. As *The New York Times* writes, "Some municipal leaders are growing wary of companies that control virtually every aspect of the waste and recycling system. 'Are these rates truly high, or is it about benefiting their corporate interest?' asked Mike Ryan, the mayor of Sunrise, Fla. 'We can't afford to have inspectors constantly looking over their shoulders."

A backlash in some U.S. cities against waste hauler fee hikes and their refusal to take certain materials from plastics to glass has led to cutting out waste haulers altogether. In

Houston, Waste Management's decision to stop taking glass infuriated residents. [35] The public pressure led to a partnership with Strategic Materials, the biggest glass recycler in North America, which had partly relied on Houston's recycled glass stream. The company and the city set up ten convenient glass drop-off locations throughout Houston. If Houston can do that, so can cities in California.

How The Beverage Industry Helps Itself

In California, producers and sellers of products packaged in glass, metal, or plastic containers are, so far, not made to take any responsibility for the end of life of containers. Nowhere is this clearer than in California's beverage container recycling program.

Powerful lobbies representing beverage makers, distributors, and retailers such as Pepsi and Coke, Walmart, Vons, Albertsons, Safeway, Ralphs and Rite Aid successfully resisted this responsibility by fighting off a bottle bill in California until 1986 when they wound up shaping key elements of it. Retailers and distributors successfully lobbied for a network of redemption centers with the legislation absolving them of taking containers back in-store unless centers in their parking lots or nearby closed. Now that centers are closing in droves, many retailers are refusing to be the recyclers of last resort.

In addition, producers and distributors of wine and distilled spirits successfully lobbied to be excluded from the program. Iowa's program includes wine and liquor as does Maine's. Vermont's program includes liquor. California's beverage container recycling program covers beer, malt, coolers containing wine and distilled spirits, and most non-alcoholic beverages.

Expanding beverage containers in California to include wine and distilled spirits would generate tens of millions of dollars more for the recycling program each year. California accounts for nearly 90% of the U.S.'s entire wine production and among the top ten wine-consuming states.[36] Beverage Industry market research purchased and analyzed by CRI shows that 2017 wine and spirits sales in California totaled 1.2 billion containers, 97% of which were bottles. Depending on the size, containers could each carry a deposit of a nickel or a dime.[37] Based on 2017 beverage market research, CRI estimates that the state could have raised $104 million in deposits from wine and spirits sales that year.

Far from advocating for an expansion of covered beverages, more beverage industry responsibility, new rules and recycling targets, CalRecycle is abetting retailers by not widely enforcing the current bottle deposit law or cracking down on violations. Instead, the agency granted more than 1,200 exemptions from retailer recycling responsibilities in the last three decades, according to agency data analyzed by CRI and Consumer Watchdog reports.

In the United States, major beverage companies such as Pepsi have spent millions of dollars to defeat bottle bills by claiming that container recycling programs are inconvenient and lead to higher beverage prices.[38] They argue it's more convenient for consumers to throw empties into a single bin than take them back where they came from.[39]

In fact, deposit systems that cost more to create up front are far more cost-effective in boosting recycling rates than curbside and other recycling programs, resulting in more bang for the buck. [40] Claims by the industry that deposits are a "tax" are untrue because deposits are refundable. Consumers can easily take bottles and cans back to the store as part of their shopping routine and more are likely to do so if deposits are high enough and access to redemption is ubiquitous.

The beverage industry's money buys it protection. Since 2013, the American Beverage Association has contributed $395,000 to California's state and local political campaigns, and $51 million to political action committees and measures, including to defeat soda tax initiatives, according to filings with the Secretary of State. The association spent $914,000 on lobbying during the last year, up from $380,000 the year before, *The Los Angeles Times* reported. [41]

"It's Californians who foot the bill for the bottle deposit program."

The California Grocers Association and California Independent Grocers & Convenience Stores have contributed $167,000 to individual political campaigns since 2017. Major beverage retailers, including Albertsons, Safeway, Vons Pavilions, Ralphs, Walmart, 7-Eleven, Target, Rite Aid, CVS Caremark and Walgreen's have contributed $4.3 million to political campaigns, committees and ballot measures since 2015.

Just this year alone, five bills targeting sugary drinks with taxes, warning labels, or size limits were rejected or shelved. In Europe, multinationals comply with laws on bottle recycling because they are given no choice. Nor does the EU give them a choice on packaging improvements. For example, despite objections from Coca-Cola, Danone, Nestle and PepsiCo, the EU has passed new requirements to connect plastic caps to bottles to reduce the amount of caps littering beaches.[42] The beverage industry killed off a similar bill in California in 2018.

The industry's clout in California has meant that beverage distributors and retailers assume less than two percent of the cost of the beverage recycling program, while collecting roughly the same amount back from the state in "administrative fees," according to CalRecycle data analyzed by CRI. It's Californians who foot the bill for the bottle deposit program.

Currently, extrapolating from a Consumer Watchdog audit of 50 Los Angeles-area grocery, convenience and drug stores required by the state to refund consumer bottle deposits, up to two thirds of retailers across the state may be refusing to take bottles back in store. If caught by CalRecycle, the penalty is only $100, a wrist slap fine, and the chances they will be inspected are low. 3,799 stores have signed up with CalRecycle to redeem empties in zones with no centers. After many years, CalRecycle just made this list public—unlike a shrinking list of redemption centers that consumers have long been able to search online. Consumer Watchdog requested this list to use it for its own audit.

Consumer Watchdog's audit found that half of the remaining one-third of stores that did redeem made the process difficult, requiring consumer persistence and knowledge of the bottle law and consumer rights. In addition, only 30% of the stores posted required recycling signs explaining that the stores refund deposits. Few managers at stores that took empties were generally knowledgeable and most clerks were clueless until prompted. More than once, a manager had to be summoned in order to override a cashier's rejection of containers, suggesting that corporate policy at some chains is not to train clerks and cashiers on the law.

In the wake of the recent closure of the last Santa Monica recycling center West of the 405 Freeway, consumers were directed by the City of Santa Monica to other redemption centers up to six miles away.[43] But consumers were not informed of the 14 beverage retailers on CalRecycle's list of retailers that take empties in the immediate area, perhaps because Santa Monica was not made aware by CalRecycle.

How CalRecycle Helps Itself

Today, recycling regulator CalRecycle appears to be amenable to the beverage industry's wish to take even *less* responsibility for beverage container recycling. Instead, the agency appears to favor growing profits for waste haulers by increasing the volume of bottles and cans thrown into curbside recycling bins. CalRecycle spent nearly $1 million on a Berkeley study to justify easing the few requirements on the retail beverage industry that currently exist.[44]

In California, the state pays extra "handling" fees to redemption centers that are the first to locate within a half-mile radius of a major supermarket in state-designated consumer

"convenience zones." These redemption centers, located in store parking lots, generally have higher expenses. Out of about 1,250 redemption centers now left in the state, around half receive handling fees. In addition, redemption centers in rural locations also have higher expenses such as getting collected materials to market.

The Berkeley study argues that closure of from one third to all handling centers across California "would not have a major impact on the welfare of California residents except perhaps for rural residents that may live a significant distance away from any other recycling centers." The study instead champions curbside recycling as "the most convenient way to recycle: it has no lines, travel time or open hours."

The study also recommends against doubling California's deposit because that would incentivize consumers to return bottles for refunds. That would mean less deposit revenue for curbside haulers and would leave CalRecycle with less unredeemed deposit money to dispense.

In fact, this conclusion is incorrect. If California's deposit was doubled, that would double the value of each unclaimed deposit. Though more consumers would be motivated to redeem deposits, roughly the same amount of money would be left uncollected. This would leave more or less the same amount of money unclaimed to run the program. If the amount of money paid to curbside and drop-off recycling programs that siphon off consumer deposits was also reduced, the state could wind up with more money overall to put into redemption centers and other services.

All bottle deposit programs rely on unclaimed deposits to help finance the system. Dependency on unclaimed deposits can encourage whoever runs the system to ensure that more deposits remain uncollected for their benefit. In Europe, the right financial incentives and penalties encourage industry to run deposit programs efficiently while ensuring wide access to redemption.

Still, dependency on unclaimed deposits can encourage whoever runs the system to ensure that more deposits remain uncollected. One way to counteract that is to increase deposits when redemption rates fall below a set target. For example, Oregon adopted a law in 2011 that stated the deposit value would automatically double to a dime if return rates fell below 80% for two years in a row.[45] In 2015, the return rate was 64.5%. That was lower than the previous year's return rate of 68.3%, and far below the state average of more than 90% over the past decade.

The deposit was doubled, and redemption grew. In 2018, the redemption rate hit 90% and then settled for the year at 81%. The industry consortium that runs the deposit system, the Oregon Beverage Recycling Cooperative, reports that in the first quarter of 2019, redemption rates exceeded 90%.[46]

The Berkeley study's authors who push curbside recycling as a better solution for bottles and cans also appear unaware of the qualitative difference between curbside recycling and the separation of bottles and cans from all other recyclables. The separation of these materials from the rest of what goes into single recycling bins results in lower contamination rates. Nor do they explore the higher landfilling and incineration rates of bottles and cans from single-stream systems.

"There is a paradox in deposit systems that rely on unclaimed deposits to finance the system."

The study on "convenient" beverage container recycling in California never engages the issue of whether retail stores should have to take empties back in-store as a critical way to increase convenience. It does recommend "easing" convenience zone requirements, which would result in fewer stores having to take empties back. It recommends no action to save smaller centers.

CalRecyle wanting to cut the number of redemption centers that form the backbone of the state's once-vaunted bottle recycling program, while allowing even more stores to get out of taking empties back, is an example of an agency prioritizing bureaucratic and corporate interests over consumer interests.

Producer Responsibility

As *The Mercury News* opined in an editorial, "It's time to shift the cost and recycling burden. The nine other states with redeemable deposit programs haven't seen the same decline in recycling rates as California, according to a 2017 report from the state Legislative Analyst's Office. That's in part because beverage distributors play a more significant role in those states and are responsible for most of the recycling cost."

Other programs under CalRecycle's purview that have shifted that responsibility to industry could be applicable to the container recycling program. For example, the state did shift the responsibility for recycling paint and mattresses to industry in laws passed in 2010 and 2013. These industry-led statewide programs, overseen by CalRecycle, manage the recycling and disposal of these products.

Paintcare, steward of the paint program, reported in fiscal year 2017-18 that 98.5% of all Californians have access to a drop off site for unwanted paint within 15 miles of where

they live.[47] Paintcare completed 505 pickups of large volumes of 200 gallons of paint or more and processed enough gallons to paint the walls of nearly 3.5 million rooms. Out of all paint sold each year, ten percent is left over. They estimated they processed 54% of it. Similar progress was reported by the Mattress Recycling Council. They collected nearly 1.3 million mattresses and foundations in 2017, surpassing the number of units collected in 2016 by 35%.[48] The weight of the material recycled also increased by 35% in 2017 to nearly 40 million pounds.

Both are examples of "Extended Producer Responsibility" that places a shared responsibility for end-of-life product management on producers and all entities involved in the product chain, instead of onto the general public only.[49] This encourages product design changes that minimize negative impacts on human health and the environment at every stage of the product's lifecycle, according to CalRecycle.

The next logical step—extending producer responsibility to the beverage container recycling program—is not a new concept. In fact, CalRecycle commissioned a study on how to restructure the deposit system in 2009.[50] The report, by the Sacramento-based R3 consulting group, and CM Consulting of Ontario, Canada compared bottle deposit programs in British Columbia, Ontario, and Germany to California's.

The report found merit in such programs, all of which are based on the producer responsibility principle. "There seems to be a consensus evolving in North America that good EPR [Extended Producer Responsibility] programs are results-based rather than highly prescriptive. In other words, the government's role is to set performance standards in the public interest (with stakeholder input), and then step aside and let producers design and operate effective programs to recover their products. Then, government's role is to ensure transparency and accountability for outcomes."

The programs were driving successful beverage container packaging redesign, recycling and program innovation in Canada and Europe. The report and stakeholder comments were never published on CalRecycle's website and the findings and recommendations appear to have been all but forgotten. Meanwhile, those programs reviewed have redemption rates of 80% to 95%, far surpassing California's 66% redemption rate.

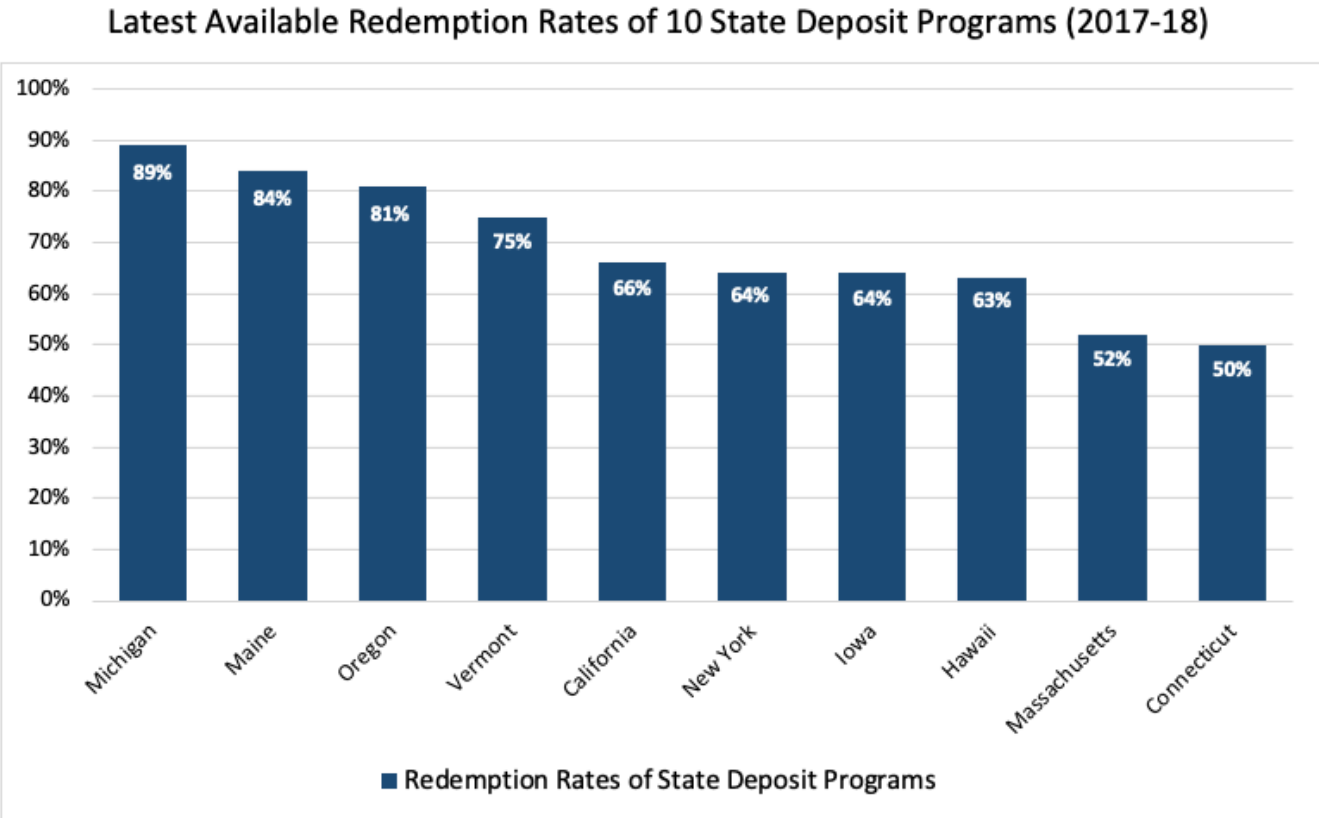
California And Other States

As the R3 report pointed out, the three most crucial aspects of successful bottle deposit programs are the deposit amount, consumer education, and wide access to redemption. Higher redemption rates are directly linked to consumer convenience. Yet, California's system is the most inconvenient in the world.

In California—unlike eight out of nine other states with bottle deposit programs—beverage retailers from grocery chains to big box, convenience and drugstore chains, are not required to take back empties alongside redemption centers.[51] The law obligated them to be recyclers of last resort if redemption centers failed to materialize or closed. Now that redemption centers are in economic crisis, the majority of retailers are refusing to fulfill those responsibilities.[52]

The largest chain of redemption centers in California, rePlanet, announced in August the closure of the last of its 284 centers throughout the state. That now leaves the state with 1,226 redemption centers, less than half the number that the state had five years ago. Now, each redemption center has to serve an average of 32,000 people, According to CRI. In the ten worst hit counties, eight of them in the Bay Area, each center serves more than 60,000, according to CRI's analysis of CalRecycle data.

The state regulator, CalRecycle, did not publish a list of stores providing redemption services on their website for consumers until August of 2019 and spent no money last year educating the public about this option. Many stores do not even educate their own



employees on the bottle law. Consumers are clueless about their right to redeem at retail stores when no redemption center exists within a half mile, so the number of empties thrown away or littered is growing.

Meantime, redemption centers are underpaid by the state while being left to generate revenue from scrap sales on rocky domestic and world markets. Earlier this year, CRI's analysis of CalRecycle data concluded that some 400 more centers were on track to close without sufficient long-term funding. rePlanet closed 284 locations within a few months of that prediction. If the program is not fundamentally reformed in the next 24 months, and supermarkets are not forced to live up to their redemption obligations, there will not be much of a bottle recycling program left to administer.

"CalRecycle data concluded that some 400 more centers were on track to close without sufficient long-term funding."

Returning empties right to the store where you do your shopping dramatically increases consumer convenience.

Seven other states and the vast majority of programs worldwide mandate redemption at *both* stores and redemption centers. In Michigan, the eighth state, consumers have only one place to redeem—retail stores that sell beverages. The lack of consumer convenience created by drastic restrictions on access to deposit refunds hobbles California. Normally seen as the leader in any progressive pack, California is now in fifth place when it comes to its bottle redemption rates.

Oregon and Michigan

Oregon and Michigan are among the ten states that have bottle deposit programs with the highest redemption rates. Oregon's hit 90% during 2018, settling at 81% for the year. Michigan's is 89% for 2018.

These states also have deposits twice as high as California's. Nearly every state program has seen declining redemption rates over the last several years, but Oregon is the one state that has experienced dramatic increases instead. Oregon jumped from 64% to a 73% redemption rate between 2016 and 2017. It doubled its deposit from a nickel to a dime on April 1 of 2017, incentivizing consumers to redeem empties. That generated enormous growth in the redemption rate in just nine months.

Oregon was the first state to pass a bottle bill in 1971. Today, consumers can return empties in-store or at redemption centers.[53] Redemption sites, called BottleDrop Centers, provide consumers with Reverse Vending Machines (RVMs) where they can redeem up to 350 bottles and cans per person per day and get cash automatically from kiosks, or they can have a center employee sort up to 50 bottles and cans per person and issue refunds.

Consumers can also set up online accounts, get labels and green bags, and drop them off anytime, 24 hours a day, at redemption centers or participating stores for credit. Big retailers with no redemption center nearby must accept up to 144 containers per person per day.

The program is run by a member-owned and run cooperative corporation called the Oregon Beverage Recycling Cooperative (OBRC). The entire recycling process is handled by the beverage industry at no cost to the taxpayer, according to OBRC.[54] The cooperative manages the deposit flow, reimburses grocery retailers for refunds paid to the public (grocery stores are charged the deposit when distributors sell them beverages wholesale), and arranges pick up and processing of returned beverage containers across the state, as well as operating redemption centers.

The OBRC has worked to modernize its BottleDrop redemption system not just to help consumers with access to redemption services, but also to help reduce burdens on retailers to accept empties and then deliver them for processing.[55] For example, in 2011 Oregon had only two redemption centers. That year the state approved expansion of that pilot project. Today, the OBRC offers 25 centers with 280 RVMs.[56] Participating retail stores

total 2,230 and offer access to 423 of them. Consumers can open redemption accounts online. They can choose between hand-counted or automated returns or can drop off bags of containers for automatic credit. They can obtain refunds via credit and additional discounts at participating stores, cash, or donate the deposits. The average amount refunded to account holders in 2018 was $102, according to the cooperative.

After tractor trailers pick up the beverage containers, they are counted, sorted, crushed, and baled for delivery to one of eight recycling facilities around the state. More than 138 million pounds of beverage containers are diverted from landfills every year that way. The separation of glass, plastic and aluminum from the rest of the recycling stream means it is cleaner and therefore easier to sell the material domestically. Doubling the state's deposit to a dime also dramatically boosted consumer participation.

Recycling rates in states such as Oregon and Michigan dramatically outpace states with nickel deposits, according to CRI, where redemption rates are currently stuck between 50% and 70%. In Michigan, another consumer incentive to recycle is contained in its state law that requires retailers to refund $25 worth of deposits per person per day—or more at the stores' discretion. Many stores are provided with RVMs.

Successful Recycling Programs In The Rest Of The World

Germany

European countries such as Germany and Norway are light years ahead of California in terms of their bottle deposit systems achieving high redemption rates. They do this by putting the responsibility of the end-of-life management of containers and other packaging onto industry.

Many European countries with bottle deposit programs mandate that companies meet high standards of packaging recyclability to qualify for Green Dot status.[57] The Green Dot trademark, invented by the Germans, is the symbol for a European network handling the recycling of consumer goods packaging. Product makers pay a license fee, which funds the system. Fees and covered materials vary by country. This system incentivizes industry to cut down on packaging in order to decrease their licensing fees.

In Germany, manufacturers pay a licensing fee to an industry consortium in exchange for permission to add a Green Dot logo to their labels. The logo indicates a high degree of recyclability and that this packaging should be sorted into separate yellow bags or bins at residences, outside supermarkets, or in public parks for pick up.[58]

The licensing fee is calculated on the basis of packaging weight, complexity, material type used, and volumes of the product produced. This has led to the invention of smaller and lighter-weight, more easily recyclable packaging, which leads to lower license fees. The system has been adopted by other European countries. This year, the law was reformed and broadened to require any company selling into the German market, including online retailers, to comply with German packaging laws.[59] As of 2021, new EU rules kick in banning single-use plastics such as food packaging, straws and coffee cups altogether.

In Germany, the beverage industry runs the country's bottle deposit system and brings the scrap to market. Consumers pay a comparatively higher deposit, up to 28 cents, to incentivize container recycling and raise redemption rates. Consumers redeem deposits at supermarkets or other retailers. The collection system is 80% automated via RVMs and the rest of the containers are redeemed manually.[60] Consumers can also get refunds from beverage delivery companies via scheduled home pickups. Retailers and the beverage industry bear the costs of the system and are allowed to keep any unclaimed deposits. The rate of redemption is 96% for aluminum cans and 98.5% for PET plastic.

Moreover, the bottle deposit system is part of a larger national policy on the recycling of all packaging. The country follows a "polluter pays" principle, enshrined in its 1991 packaging law, meaning the producer, not the consumer, must pay for reuse or recycling of packaging. German industry set up a "dual system" of waste collection. Household packaging is separated and picked up in parallel to trash collection. This industry-funded system is run by Duales System Deutschland GmbH, or DSD, that serves the world's

Paper, Plastic, Waste, Glass, Metal

single biggest garbage recycling system where 80 million people are required to sort their waste into separate bins.[61]

Germans recycle much more than Americans largely because they are given the opportunity and are extensively informed by waste haulers about how to correctly sort waste and recyclables via color-coded bins and bags.[62] Consumers have access to seven different bins, including green dot packaging, paper, compost, general trash, and clear, brown and green glass separated by color. An incorrectly sorted bin will not be collected, furthering consumer awareness and education. The incentive is high to separate paper, plastic and glass from household trash because recyclables get picked up every two weeks but trash only once a month. The price paid for trash pickup depends on how much trash a consumer generates, whereas pickup of recyclables is free.

Norway

Norway's bottle deposit system mirrors Germany's. The system is run by Infinitum AS, a consortium of major food and drink makers and major supermarket chains that reimburses retailers the refunds. Deposits are up to 30 cents on single-use bottles and multiple color-coded bins and conveniently-located RVMs are provided. Return rates are high—95.4% of PET bottles and 96.6% of all drink cans.[63]

All stores selling beverages have to collect empties and refund deposits. Bigger stores use RVMs that can scan barcodes, crush and pack the bottles for collection as well as issue refunds. Small stores generally collect empties over the counter. Every store gets a fee per bottle or can. Retailers report that the service increases foot traffic in the store. Norwegians can return empties at 15,000 redemption locations with 95% automation.[64]

About 45% of the revenue needed to run the system comes from the five percent of unredeemed deposits. Infinitum also owns and sells the recycled scrap for revenue and collects administrative fees.

According to Infinitum's chief executive, 97% of all plastic bottles in Norway are recycled, 92% are so clean that they can be turned back into beverage containers. Some of the material has already been recycled 50 times and less than one percent of the material ends up in the environment. "We want to get to the point where people realize they are buying the product but just borrowing the packaging," Kjell Olav Maldum, CEO of Infinitum, told *The Guardian*.

Producers and importers of beverages packaged in cans or non-refillable PET bottles register their products in the deposit system. The deposit they collect is paid to Infinitum to label the bottles and cans with the deposit symbol. Norway also puts an environmental tax on all producers of plastic bottles. The higher the national recycling rate, the less tax companies have to pay. If they collectively manage to recycle more than 95% of cans and recyclable PET plastic containers, which they have done every year since 2011—they are exempted from paying the tax altogether.

Lithuania

The Baltic country of Lithuania is the one of latest to pick up on Norway and Germany's example of a successful bottle deposit system. It uses the same national deposit model and has seen widespread success since the system's launch in 2016 when the first RVMs were introduced at retail shops.

An association of Lithuanian brewers, trade enterprises and mineral water manufacturers runs the system. Užstato Sistemos Administratorius (USAD) handles the deposit system, reporting, logistics, marketing collected materials and educating stakeholders and consumers. Its sources of income include unredeemed deposits, revenue from the sale of collected materials and administration fees paid by beverage producers. Eligible stores get a free RVM. USAD pays a handling fee per collected container to the store, to cover RVM-related costs such as extra space, setup, and maintenance. The provider of the machines recoups the investment via a fee USAD pays for each container collected through an RVM.

Retail shops with RVMs are paid a higher handling fee than shops without them. Consumers are refunded their deposit as vouchers that can be redeemed in-store as cash or credit towards their shopping bill. That brings in additional foot traffic. One national supermarket chain installed approximately 200 RVMs and watched as business grew with customers using their deposits to buy new products. Laurynas Vilimas, Managing Director of the Lithuanian Retailers Association, said: "I can say with absolute confidence the deposit return scheme was the right thing to do."

The scheme has been widely labeled as a success due to the surprisingly rapid results,

with 1.2 billion units of plastic beverage containers returned in just two years.[65] There are now over 1,000 machines in large retail chains across the country and more than 1,800 small shops are also accepting plastic containers brought in by customers. The deposit is a comparatively low 10 Euro cents, but in two years the recycling rate for PET bottles went from 34% before the system began to 91.9% by the end of the second year.[66]

The advantage of RVMs is that it cuts down on the time it takes consumers to redeem empties while industry collects a stream of clean recyclables. The technology also can read barcodes on containers to determine the manufacturer and the product. Virtually all bottle deposit systems around the world, except for California and many Canadian provinces, have barcode-based recording systems.[67] If beverage distributors would get actively involved in the barcoding by adding code on their containers to make sure RVMs could not read containers brought in from out of state, that could help in cutting down on bottle recycling fraud. In the U.S., containers are not labelled state-by-state and thus not traceable when large quantities are brought into California for illegal redemption.

Conclusion & Recommendations

Single-stream recycling has proven itself a bust—the method contaminates the stream of potentially high-grade recyclables that could be turned into higher value products. The

method has served to hurt the U.S. market for recyclable scrap at home and abroad. To improve the quantity of clean recyclable material, California needs to move away from rewarding waste haulers for their recycling services built on the myth of quality recycling tied to a single bin and towards the beverage industry where the responsibility for recycling should really reside.

The factors that make bottle deposit systems in other countries successful are the degree of consumer convenience offered, the education of consumers, and the amount of deposits. In Europe and states such as Oregon and Michigan, consumers can return empties in stores and have access to RVMs, often placed by grocery chains in specially-designated rooms. Deposits are higher, incentivizing redemption, and consumers are educated on the deposit systems.

In California, this is not the case. Consumer convenience is rare and so is an automated way to return empties. California retailers found ways to eliminate RVMs from stores years ago by refusing to pay to have them serviced or to staff them with employees that would empty them, according to industry sources. Many beverage retailers that claim to CalRecycle that they take back empties where no redemption centers can be found, really

aren't. They are betting that they will not be caught and, if they are, the penalty will be a one-time wrist slap of $100—essentially cab fare.

Economically, recycling also beats landfilling or incineration in creating new jobs, sustaining ten times more jobs on a per-ton basis of materials, according to the Institute for Local Self-Reliance.[68]

Specifically, container deposit systems create 11 to 38 times more jobs than a curbside recycling system for beverage containers, according to a study produced for CRI.[69] Ton for ton, deposit systems create at least five times more jobs in container collection, sorting and transport than in garbage collecting, hauling, and landfilling. The reason deposit systems create the most jobs among the leading systems for container recovery, is that they recover more of the target material.

To make a serious dent in reducing the contamination of recyclable materials, such as empty beverage containers, California must revert to the way recycling was handled before—materials must be separated into two or more streams.

One place to start major reform is the state's beverage container recycling program. The fact that California already separates out recyclable beverage containers from the larger waste stream is a plus and something to refine as the overall state of recycling in California is improved. To that end, Consumer Watchdog recommends the following to the Administration and lawmakers:

- **Require CalRecycle to enforce the bottle deposit law by levying meaningful fines on retail stores for each day, including retroactively, that they shirk their current recycling responsibilities.** A recent Consumer Watchdog audit found that two thirds of stores in the Los Angeles area obligated to take back bottles refused to do so.

- **Expand the beverages included under the deposit program to wine and distilled spirits.** This will increase the amount of money generated for the beverage container recycling program by roughly $100 million annually and provide funds to support redemption.

- **Mandate that all major grocery store, big box, convenience and drugstore chains take back empty beverage containers along with redemption centers.** Consider paying stores handling fees to handle empties, install and service Reverse Vending Machines.

- **Require CalRecycle to educate consumers about their in-store return options and the new availability on their website of a searchable list**

of stores redeeming deposits. CalRecycle had never posted this list, though it posts a searchable list of redemption centers.

- **Double consumer deposits to incentivize consumers to recycle.** California charges a nickel deposit on specific beverage containers under 24 ounces and a dime on containers of 24 ounces and up. Doubling deposits while increasing convenient return options would boost redemption rates dramatically.

- **Rebalance state payments by eliminating unjustified subsidies to waste haulers while paying redemption centers a flat fee for service that provides them a reasonable return.** Currently, redemption centers take all of the market risk to generate revenue from what they collect without additional revenue streams that waste haulers generate.

- **Call for reform of the bottle law that would include a redemption target of 90% with new financial penalties on the beverage industry if the target is missed.** This model has worked to spur industry in Norway to produce very high-quality recyclable material to avoid tax penalties.

- **Ultimately, shift responsibility for the recycling of containers to the beverage and grocery industry.** Currently, redemption centers own the recyclable materials. In most other states, the beverage distributors own the recyclable materials. In Europe, ownership and the running of the systems are left up to industrial consortiums that are in a better position to market materials back to makers of bottles and cans. Oregon mimics this system.

Citations

[1] See Consumer Watchdog's report, *Half a Nickel: How California Consumers Get Deposits Ripped Off On Every Bottle Deposit They Pay*, here: https://www.consumerwatchdog.org/report/half-nickel-how-california-consumers-get-ripped-every-bottle-deposit-they-pay

[2] For more on the pitfalls of single-stream recycling, see: https://fivethirtyeight.com/features/the-era-of-easy-recycling-may-be-coming-to-an-end/

[3] For more about contamination rates and the rising costs associated with recycling, see: https://www.cassinfo.com/waste-expense-management/waste-and-recycling-blog/predictions-for-waste-expenses-2019-costs-on-the-rise

[4] For more on CRI's breakdown of payments to curbside and drop-off operators, see: http://www.container-recycling.org/images/stories/PDF/CACurbsideandDropoffProfitsFINAL.pdf

[5] State payments to redemption centers were calculated by CRI using CalRecycle's Fact Sheet June 2018 on the beverage container recycling program and other CalRecycle data on processing fees.

[6] For the Institute for Local Self-Reliance article, see: https://ilsr.org/explaining-the-waste-knot/

[7] On municipal leaders being wary of waste hauler conflicts of interest, see: https://www.nytimes.com/2019/03/16/business/local-recycling-costs.html

[8] For the *Mercury News* editorial, see: https://www.mercurynews.com/2019/04/12/editorial-fix-californias-broken-bottle-and-can-recycling-system/

[9] For the R3 report, see: http://www.bottlebill.org/assets/pdfs/pubs/2009-BeverageSystemsCalifornia.pdf

[10] To compare state bottle deposit systems, see: http://www.bottlebill.org

[11] To see the results of a Consumer Watchdog audit of Los Angeles-area beverage retailers and redemption refusal, from which our state-level refusal rate is extrapolated, see: https://www.consumerwatchdog.org/energy/consumer-watchdog-report-shows-66-grocery-stores-surveyed-refused-recycle

[12] For more on Michigan's bottle law and recycling system, see: https://www.michigan.gov/documents/deq/dnre-whmd-sw-mibottledepositlawFAQ_318782_7.pdf

[13] For more on how bottle bills work, see: http://www.ncsl.org/research/environment-and-natural-resources/state-beverage-container-laws.aspx
And for more on the Michigan bottle law, see: https://www.michigan.gov/documents/deq/deq-ogl-mglpf-stutz_249882_7.pdf

[14] To see how the Brown Administration used special accounts for budgetary shortfalls, see: https://www.sacbee.com/news/investigations/state-parks-funding/article2575290.html

[15]For a video on how RVMs work, see: https://www.youtube.com/watch?v=I2C7GjP1fGs

[16] For more on Germany's municipal solid waste, see:
http://www.seas.columbia.edu/earth/wtert/sofos/Evridiki_Bersi_Kathimerini.pdf

[17] For remarks by Infinitum CEO Olav Maldum, see: https://www.sciencealert.com/norway-s-recycling-scheme-is-so-effective-92-percent-of-plastic-bottles-can-be-reused

[18] For more on Lithuania's system, see:
https://www.openaccessgovernment.org/recycling-lithuania-deposit-system-exceeds-all-expectations/45003/

[19] For more on RVM technology, see:
https://www.vision-systems.com/factory/consumer-packaged-goods/article/16738941/reverse-vending-machines-help-europeans-recycle

[20] For more on how single-stream facilities contaminate recyclables, see: "Tossed to and fro" in the *Tribune-Review* (Greensburg, PA), December 16, 2018.

[21] For the Minnesota study, see: http://www.maroneysinc.com/images/Downstream_of_Single_Stream.pdf

[22] For more on single-stream systems, see the Container Recycling Institute's publications at: www.container-recycling.org/index.php/issues/single-stream-recycling
Specifically:
http://www.container-recycling.org/assets/pdfs/reports/2009-SingleStream.pdf
and
http://www.container-recycling.org/assets/pdfs/media/2010-2-SingleStreamUncovered.pdf
and
http://www.container-recycling.org/assets/pdfs/ACommonTheme.pdf

[23] For more on Americans and their attitude to recycling, see https://www.greenamerica.org/rethinking-recycling/americans-are-really-bad-recycling-only-because-were-not-trying-very-hard

[24] For more on single-stream versus dual-stream programs and effects on processors, see: http://www.container-recycling.org/assets/pdfs/ACommonTheme.pdf

[25] For more on overall recycling of solid waste in California, see:
State of Disposal and Recycling in California: For Calendar Year 2017 at CalRecycle.ca.gov

[26] For national recycling rates and other statistics, see: https://www.rubiconglobal.com/blog-statistics-trash-recycling/

[27] For more on Californians and the trash they generate, see: https://calpirg.org/reports/cap/state-waste-california

[28] See Consumer Watchdog's report, *Half a Nickel: How California Consumers Get Deposits Ripped Off On Every Bottle Deposit They Pay,* here: https://www.consumerwatchdog.org/report/half-nickel-how-california-consumers-get-ripped-every-bottle-deposit-they-pay

[29] For more on CRI's breakdown of payments to curbside and drop-off operators, see: https://consumerwatchdog.org/sites/default/files/2019-07/CA%20CurbsideandDrop-offProfitsRevised.pdf

[30] For more on shortfalls to recycling centers, see: http://www.container-recycling.org/images/stories/PDF/Processing%20Payment%20Shortfall%20report%20April%202016%20update.pdf

[31] For more on Waste Management's profits, see: https://www.recyclingtoday.com/article/waste-management-2018-earnings/

[32] For an overview of the waste hauling industry and marketshare, see: https://ilsr.org/monopoly-and-the-us-waste-knot/

[33] For the Institute for Local Self-Reliance article, see: https://ilsr.org/explaining-the-waste-knot/

[34] For more on source separated, single-stream, and mixed waste processing methods, see: https://greenblue.org/reloop-what-is-mixed-waste-processing-or-all-in-onedirty-mrf-recycling/

[35] For more on consumer recycling activism and education on recycling, see: https://www.governing.com/topics/transportation-infrastructure/gov-recycling-lowell-massachusetts.html

[36] For more on California's wine production, see: https://www.goldmedalwineclub.com/blog/post/how-many-gallons-of-wine-does-california-produce-annually-213

[37] Some container types are not included in the current bottle deposit program such as boxed wine. Containers that are under 24 ounces carry a nickel deposit, while containers over 24 ounces carry a dime deposit.

[38] For how beverage companies embrace recycling until it costs them, see: https://www.nytimes.com/2019/07/04/business/plastic-recycling-bottle-bills.html

[39] For more on the beverage industry and bottle bills, see: https://www.fastcompany.com/90212124/whats-the-best-way-to-get-americans-to-actually-recycle

[40] For myths and facts on bottle deposit programs, see: http://www.bottlebill.org/index.php/about-bottle-bills/myths-facts

[41] For more on the beverage industry's defeat of bills to regulate sugary drinks or impose taxes, see: https://www.latimes.com/politics/la-pol-ca-soda-industry-quashes-bills-20190703-story.html

[42] For more on the EU, plastic bottle caps and other new rules on plastics, see: https://www.euractiv.com/section/circular-economy/news/drinks-giants-rail-against-eu-bottle-cap-plan/
And
http://europa.eu/rapid/press-release_IP-19-2631_en.htm

[43] For more on the closure of the Santa Monica Community Recycling Center, see: https://www.consumerwatchdog.org/energy/consumer-and-recycling-advocates-condemn-loss-last-recycling-center-west-405-freeway

[44] For the Berkeley study on "Convenient Beverage Recycling in California," see: https://www.calrecycle.ca.gov/docs/cr/bevcontainer/notices/2019/ucstudy.pdf

[45] For more on Oregon's trigger to double the deposit, see: https://thatoregonlife.com/2017/03/oregon-bottle-deposit-doubles-price/

[46] See OBRC's 2019 first quarter report here: https://www.obrc.com/Content/Reports/OBRC%20Quarterly%20Report%20Q1%202019.pdf

[47] For more on Paintcare, see: https://www.paintcare.org/paintcare-states/california/#/official-docs?infographic-summary-of-2018-california-annual-report

[48] For more on the Mattress Recycling Council in California, see: https://www.calrecycle.ca.gov/docs/cr/mattresses/mroreports/2017/2017annualrpt.pdf

[49] For more on product stewardship, see: https://www.calrecycle.ca.gov/EPR/

[50] For the 2009 report, Evaluating End-of-Life Beverage Container Management Systems for California, see:
http://www.bottlebill.org/assets/pdfs/pubs/2009-BeverageSystemsCalifornia.pdf

[51] To compare California to other U.S. bottle deposit systems and to systems in other countries, see the Bottle Bill Resource Guide at: http://www.bottlebill.org

[52] About 3,800 retail stores are signed up with CalRecycle to take back empties. But extrapolating from a survey by Consumer of 50 LA-area stores, up to two thirds may be refusing to take back empties. This represents $91 million in lost fees annually that CalRecycle could collect as stores have a choice to sign up to take back or to pay a daily fee. Only a few hundred stores opt to pay that fee, which amounts to $36,500 annually per store. See Consumer Watchdog's survey here: https://www.consumerwatchdog.org/energy/consumer-watchdog-report-shows-66-grocery-stores-surveyed-refused-recycle

[53] For more on Oregon's bottle deposit system, see: https://www.npr.org/sections/thesalt/2019/02/04/688656261/oregon-bottle-deposit-system-hits-90-percent-redemption-rate
And
https://www.oregon.gov/deq/recycling/Pages/Bottle-Bill.aspx

[54] For more on OBRC, see: https://www.obrc.com/About

[55] For more on the evolution of Oregon's redemption system, see: https://www.oregon.gov/deq/recycling/Pages/Bottle-Bill.aspx

[56] For more data on Oregon's bottle deposit program, see:
https://www.obrc.com/Content/Reports/OBRC%20Quarterly%20Report%20Q1%202019.pdf

[57] For more on the Green Dot system, see: https://en.wikipedia.org/wiki/Green_Dot_(symbol)

[58] For a simple overview of the green dot system, see: https://en.wikipedia.org/wiki/File:4_PAO_12M_2007-07-12.jpg

[59] For more on the German Packaging Law that went into effect in January 2019, see: https://packagingeurope.com/getting-ready-for-the-german-packaging-law/

[60] For a short review of many different foreign bottle deposit systems, see: http://www.cmconsultinginc.com/wp-content/uploads/2017/05/BOOK-Deposit-Global-24May2017-for-Website.pdf

[61] For more on Germany's container recycling system, see: https://ssts16cc.wordpress.com/2016/02/18/recycling-germany-vs-united-states/
And
https://www.recyclingtoday.com/article/german-agency-looking-at-dsd-monopoly/

[62] For more on German consumers and recycling, see: https://ssts16cc.wordpress.com/2016/02/18/recycling-germany-vs-united-states/

[63] For a comparison between the German and the Norwegian deposit systems, see: https://www.dw.com/en/plastic-bottle-recycling-champion-norway-or-germany/a-44880423

[64] For more on Norway and plastics recycling, see: https://www.theguardian.com/environment/2018/jul/12/can-norway-help-us-solve-the-plastic-crisis-one-bottle-at-a-time
And
https://www.sciencealert.com/norway-s-recycling-scheme-is-so-effective-92-percent-of-plastic-bottles-can-be-reused

[65] For more on Lithuania's bottle recycling system, see: https://greennews.ie/lithuania-teach-other-countries-how-to-manage-plastic-waste/

[66] For more details on Lithuania and RVMs, see: https://www.openaccessgovernment.org/recycling-lithuania-deposit-system-exceeds-all-expectations/45003/

[67] For more on RVMs and barcodes, see:
http://www.cmconsultinginc.com/wp-content/uploads/2017/05/BOOK-Deposit-Global-24May2017-for-Website.pdf
and
https://www.vision-systems.com/factory/consumer-packaged-goods/article/16738941/reverse-vending-machines-help-europeans-recycle

[68] For more on the economic benefits of recycling, see: https://ilsr.org/recycling-means-business/

[69] For how recycling affects local economies, see:
http://www.container-recycling.org/assets/pdfs/reports/2011-ReturningToWork.pdf