

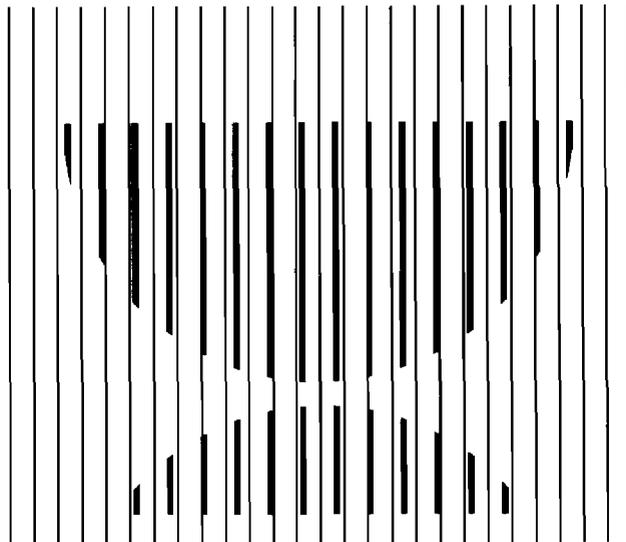


CBO STAFF MEMORANDUM

**REDUCING WASTE DISPOSAL WITH DISPOSAL-REDUCTION
CREDIT SYSTEMS**

A Case Study of Beverage Containers and Old Newspapers

February 1992



**CONGRESSIONAL BUDGET OFFICE
SECOND AND D STREETS, S.W.
WASHINGTON, D.C. 20515**



This staff memorandum was prepared in response to a request from Representative Al Swift, Chairman of the Subcommittee on Transportation and Hazardous Materials of the House Energy and Commerce Committee. It examines how disposal-reduction credit systems would work if they were designed to decrease the disposal of beer and soft drink containers and newspapers.

The memorandum was prepared by Terry M. Dinan of CBO's Natural Resources and Commerce Division (NRCD) under the supervision of Roger Hitchner, Unit Chief for Natural Resources, and Jan Acton, Assistant Director for NRCD. Kim Cawley of the Budget Analysis Division provided helpful comments.

TABLE OF CONTENTS

An Overview of Disposal Reduction Credit System	1
Disposal-Reduction Credit System for Beer and Soft Drink Containers	2
Requirements of H.R. 3865	2
How Would A Disposal-Reduction Credit System Work?	3
Comparison with H.R. 3865	6
Benefits and Costs	8
Disposal-Reduction Credit System for Old Newspapers	8
Requirements for H.R. 3865	8
How Would A Disposal-Reduction Credit System Work?	9
Comparison with H.R. 3865	10
Benefits and Costs	13
Conclusions	13

TABLES

1. Generation and Recycling of Beer and Soft Drink Containers	3
2. Density Factors for Beer and Soft Drink Containers	5
3. Number of Firms and Mills that would be Eligible to Earn Disposal-Reduction Credits	10

This memorandum examines how disposal-reduction credit systems would work if they were designed to decrease the disposal of beer and soft drink containers and newspapers. For each of the two groups of materials, the memorandum describes how the policy would work; compares it with the policy proposed by H. R. 3865; and briefly discusses enforcement issues, benefits, and costs.

Broadly speaking, two approaches are discussed for reducing the amount of waste disposal:

- o a credit system that provides market incentives for manufacturers of products and users of recycled materials to select the least-costly means of meeting a target;
- o a technology-based approach, which prescribes the types of materials or amount of materials to be used in a product, such the proposal in H.R. 3865.

The credit system described in this memorandum has the potential to reduce the amount of waste disposed at lower cost to producers and consumers than a technology-based approach. If the credit system is enforced, it also assures that disposal is reduced by the desired amount--something technology-based content policies do not do. Both approaches described below could have significant enforcement costs for the government. Thus, as with most policies, the benefits associated with disposal reduction must be compared with costs of achieving them.

AN OVERVIEW OF DISPOSAL-REDUCTION CREDIT SYSTEMS

Credit systems, also referred to as tradable permits, provide a means of achieving environmental goals at lower costs than a technology-based solution because of the flexibility they provide. The federal government sets an environmental goal under a credit system, but lets market forces determine the firms that make changes in their production processes and the technologies that will be used in meeting the goal.

Disposal-reduction credit systems offer a means of achieving a decrease in the disposal of waste associated with particular products in the waste stream. Responsibility for ensuring this recovery rate rests with the manufacturers.

Disposal-reduction credit systems do not specify recycled contents for particular products; they provide a set of incentives that encourage industry to decrease waste disposal by the least costly method. This method might include any of a variety of activities, such as reusing the recycled materials to produce the original product (for example, old newspapers to make newsprint); reusing materials in new products (e.g., old newspapers to make paperboard); or exporting recycled materials. Disposal-reduction credit systems can also be designed to encourage the use of refillable containers or to reduce the weight of products being disposed. These activities are encouraged only in cases in which they provide a less costly way of reducing disposal than increasing recycling.

DISPOSAL-REDUCTION CREDIT SYSTEM FOR BEER AND SOFT DRINK CONTAINERS

This section briefly describes the requirements for manufacturers of beer and soft drink containers under H.R. 3865. It then considers how a credit system might be designed to reduce the amount of beer and soft drink containers being disposed of. Finally, it contrasts the effects of a credit system with those of H. R. 3865.

Requirements of H.R. 3865

Under H.R. 3865, all beer and soft drink containers--by 1995--would have to comply with one of the following four requirements:

- o be made of a material that has a recovery rate of at least 25 percent,
- o be made of at least 25 percent recycled materials,
- o be made in a refillable container, or
- o be reduced in weight or volume by a required percent.

All containers that do not currently comply with one of these requirements would need to be redesigned.

How Would A Disposal-Reduction Credit System Work?

The government would establish the percentage of beer and soft drink containers that must be diverted from disposal. Producers and importers of those beverages would be required to obtain enough disposal-reduction credits to ensure that the desired diversion rate is met. Firms that can reuse old containers or decrease the weight of new containers would earn disposal-reduction credits, which they would be able to sell. Domestic beer and soft drink producers would have the potential to meet their credit requirements internally, since they could earn credits by making their containers from recycled beverage containers.

Setting the Disposal-Diversion Rate. At present, 27 percent of all beer and soft drink containers are recycled. The remaining amount accounts for about four percent of all municipal solid waste disposed of. As indicated in Table 1, the amount recycled varies greatly with container type.

TABLE 1. GENERATION AND RECYCLING OF BEER AND SOFT DRINK CONTAINERS (By container type)^a

Type	Tons Generated	Percent Recycled
Glass	5.4	20
Aluminum	1.4	55
Steel	0.1	15.2
Plastic	0.4	21

SOURCE: Environmental Protection Agency, *Characterization of Municipal Solid Waste in the United States: 1990 Update* (June 1990).

- a. Generation refers to the amount of containers entering the waste stream prior to any recovery.
-

The policy could be specified in two different ways. One, a disposal-diversion rate might be set for all beer and soft drink containers. For example, 40 percent of them would need to be recycled, or reduced in weight; individual types could fall below the 40 percent level provided others rose above.

Alternatively, individual diversion rates might be set for each type of container: for example, glass at 30 percent, aluminum at 75 percent, and so on. In this case, higher recycling rates for one type of container would not compensate for lower rates on other container types.

For simplicity's sake, this study assumes an overall diversion rate of 40 percent. The policy would work in much the same way if container-specific recycling and refill rates were set.

Who Would Need Disposal-Reduction Credits? The policy could be designed in at least two different ways. Manufacturers of the beer and soft drink *containers* could be responsible for acquiring "disposal-reduction credits". Alternatively, beer and soft drink *producers* could be responsible. This example assumes the latter case. Producers are one step closer to consumers than are manufacturers and are therefore, more aware of the impact of container design on product marketing.

Under this policy, all beer and soft drink producers and importers would have to obtain four disposal-reduction credits for each 10 tons of beer and soft drink containers sold. Each credit that they obtain would assure that one ton of old containers had been diverted from disposal. Eight hundred eighty-four firms would have to comply with this requirement. The number includes 44 importers of beer, 140 domestic producers of beer, 700 domestic producers of soft drinks.¹

Who Would Earn Disposal-Reduction Credits? Firms would be able to earn a credit in one of two ways:

- o By reusing one ton of old soft drink or beer containers in an environmentally desirable way--that is, by refilling them, reprocessing them into new containers, glassphalt, plastic lumber, for exporting², and so forth; or
- o By reducing by one ton the amount of packaging associated with the total amount of product sold.

1. Information provided by the National Soft Drink Association. Imports account for 4.5 percent of all beer sold in the United States.

2. Exporting old containers reduces the number of containers disposed of in the United States and allows them to be reprocessed abroad into a variety of products.

A large number of firms would qualify to earn disposal-reduction credits. The firms would include all domestic users of old beer and soft drink containers, all exporters of these containers, and the containers producers themselves.

It should be noted that both of these methods of earning credits would reduce the weight of materials being disposed but might not reduce the volume by a proportionate amount. That is because the amount of weight associated with a given volume of beer and soft drink containers varies greatly by material (See Table 2).

Ideally, the number of credits required by producers and importers would be based on the volume of disposal capacity that their containers require. Similarly, the number of credits that firms would earn from reusing old beverage containers or redesigning new ones would be based on the volume of disposal capacity these activities preserved. Because it is less complicated to assess credit requirements and earnings on a weight basis than on a volume basis, weight has been used in this example.

TABLE 2. DENSITY FACTORS FOR BEER AND SOFT DRINK CONTAINERS (By container type)

Material	Pounds per cubic yard
Glass	2,800
Steel	560
Aluminum	250
Plastic (rigid containers)	355

SOURCE: Environmental Protection Agency, *Characterization of Municipal Solid Waste in the United States: 1990 Update* (June 1990).

Comparison with H.R. 3865

Both a disposal-reduction credit system and H.R. 3865 could decrease the amount of beer and soft drink containers disposed of. A disposal-reduction credit system however, would make the decrease more certain. In addition, a credit system could achieve the desired decrease at a lower cost to industry and consumers. Both H.R. 3865 and disposal-reduction credit system could be costly to enforce.

Effect on Disposal. The policy proposed in H.R. 3865 could promote activities that do not reduce the quantity of beverage containers that are disposed of. If manufacturers choose to comply with H.R. 3865 by reducing the weight of their containers, the tons disposed of could decrease. (Provided that these changes do not make the containers less recyclable.) If manufacturers choose to switch to materials with a recycling rate higher than 25 percent, the number of containers disposed of could be unchanged. For example, beverage manufacturers now using glass or plastic can comply with H.R. 3865 by converting to aluminum, which currently has a recycling rate of 55 percent. That would increase the supply of old aluminum containers but would not ensure an increase in the absolute number of those recycled. In fact, the share of aluminum containers that are recycled could fall.

Finally, manufacturers could comply with H.R. 3865 by making their beverage containers from recycled materials. At first look, that would appear to produce a corresponding decrease in the number of containers disposed of. But as manufacturers buy up more old beer and soft drink containers for use in their own products, the numbers of old containers used for other domestic purposes (such as glassphalt or carpet backing) or exported could decrease.

A disposal-reduction credit system would specify the percent of beer and soft drink containers to be diverted from disposal through recycling, refilling, or weight reduction. If the policy is enforced, it would guarantee that the goals were met.

Cost to Industry and Consumers. In redesigning their products to use more recycled materials, decrease their weight, or make them refillable, different producers would face different costs. Cost differences could result from size (large producers may be better able to achieve economies of scale) or location (some producers are situated closer to sources of recycled materials).

Under H.R. 3865, all producers would have to comply with one of the four requirements specified above, regardless of the cost of doing so. All beverage containers that currently do not meet one of the four would have to be redesigned. Such redesigns may be costly to industry and consumers.

A disposal-reduction credit system could reduce the cost to industry in two ways. First, not all manufacturers currently failing to meet one of the four requirements specified in H.R. 3865 would be required to redesign their containers. Producers who face high costs for meeting these requirements could buy disposal-reduction credits from beverage container manufacturers facing lower costs. Second, a credit system provides an incentive for the reuse of old beverage containers in all domestic products and for export. If exports and non-beverage container domestic uses can be expanded at a lower cost than expanding the use of old containers in the manufacture of new beverage containers, then container manufacturers would buy credits from these final users. This flexibility could achieve the goal of reducing disposal of beverage containers at a significantly lower cost to industry than H.R. 3865 can achieve. The extent of cost savings that would occur, depends on how much the cost of using old containers varies across different final uses and how willing firms are to buy and sell credits.

Enforcement. The enforcement costs would be significant under both H.R. 3865 and a disposal-reduction credit system. Under H.R. 3865, all domestic beer and soft drink producers would have report to the Environmental Protection Agency (EPA) on each type of container they use. In addition, all distributors and wholesalers of imported beer would be required to file a report on each one imported. EPA would have to make sure that each container type was in compliance.

For the required diversion rate to be met under a disposal-reduction credit system, the government would need to verify that all beer and soft drink producers and importers obtain the correct number of disposal-reduction credits. In addition, it would need to be certain that these credits are legitimate--that for each credit earned, one ton of beer and soft drink containers had been diverted from disposal. As indicated above, approximately 884 firms would be required to obtain disposal-reduction credits. The burden of ensuring that these firms actually bought the correct number of credits could be reduced by requiring firms to report both credit purchases and credit sales to the federal government.

Reported purchases could then be cross checked with reported sales to monitor compliance.

The most difficult aspect of enforcing the credit system would be verifying that the credits exchanged were legitimate. A large number of firms would be eligible to earn them. The enforcement burden might be reduced somewhat by limiting the number of firms eligible to earn credits to only those that are major users of old beer and soft drink containers.

Benefits and Costs

Both a disposal-reduction credit system and H.R. 3865 would reduce disposal of municipal solid waste. Both would also entail social costs. These costs include higher prices for beer and soft drinks and the costs of government enforcement. In both cases the costs of administering the policy and complying with the requirements should be weighed against the benefits that such a policy would bring about.

DISPOSAL-REDUCTION CREDIT SYSTEM FOR OLD NEWSPAPERS

This section briefly sets forth the requirements for manufacturers of newsprint under H.R. 3865. It then describes how a disposal-reduction credit system might be designed to reduce the amount of old newspapers being disposed of. Finally, it contrasts the effects of a credit system with those of H. R. 3865.

Requirements of H.R. 3865

Under H.R. 3865, newspapers must be recovered at a rate of at least 40 percent by 1995. Each manufacturer is required to submit an annual report on his progress to EPA. If the 40 percent recovery rate is not met by 1995, the Administrator of EPA must establish minimum recycled-content standards. The Administrator will consider whether a credit system is an appropriate means of compliance with the standards.

How Would A Disposal-Reduction Credit System Work?

The government would set an overall requirement for the percentage of old newspapers to be recovered. Producers and importers of newsprint would be required to buy enough disposal-reduction credits to ensure meeting the desired recovery rate. Firms that can reuse old newspapers in domestic production or for export would earn disposal-reduction credits, which they would be able to sell. Domestic newsprint producers may use the credits that they earn to meet their own credit requirements and sell any excess.

Setting the Recovery Rate. At present, one-third of all old newspapers are recycled. The remaining amount disposed of accounts for nearly six percent of all municipal solid waste. For demonstration purposes, a 40 percent recovery rate is used here.

Who Would Need Disposal-reduction Credits? Under this policy, all newsprint producers and importers would have to obtain four disposal-reduction credits for each 10 tons of newsprint sold. Nineteen domestic producers of newsprint (with a total of 24 mills) would need to obtain credits. Based on data from the Customs Office there may be more than 900 importers of newsprint in a year.³

Who Would Earn the Credits? Firms would be able to earn one disposal-reduction credit for each ton of old newspapers that is used in domestic production or exported. The major final users of old newspaper are listed in Table 3.

There are also numerous minor users. They include manufacturers of cellulosic insulation, packing material, hydromulch, animal bedding, and molded pulp. Minor users accounted for 10 percent all old newspaper recovered in 1988.

3. There were 915 importers of newsprint between October 1987 and September 1988.

TABLE 3. NUMBER OF FIRMS AND MILLS THAT WOULD BE ELIGIBLE TO EARN DISPOSAL-REDUCTION CREDITS

Use	Number of Firms	Number of Mills
Domestic		
Recycled Tissue	28	50
Recycled Paperboard	93	192
Recycled Newsprint	11	13
Exports (December 1990 only)	47	a

SOURCE: American Paper Institute.

a. Not applicable.

Comparison with H.R. 3865

Both a disposal-reduction credit system and H.R. 3865 would result in a decrease in the number of old newspapers disposed of. A credit system however, would provide greater assurance that the number disposed is decreased by the desired amount. In addition, a credit system could effect the decrease at lower cost. Both H.R. 3865 and a disposal-reduction credit system could be expensive to administer.

Effect on Disposal. Although H.R. 3865 provides an incentive for the industry as a whole to achieve a 40 percent recovery of old newspapers by 1995, no individual manufacturer would be motivated to change his production process. An advantage of the credit system is that it gives individual producers direct responsibility for meeting the desired recovery rate.

If the 40 percent recovery rate is not met by 1995, H.R. 3865 would require EPA to set a minimum recycled-content for newsprint. Although that would ensure an increase in the recycled-content, it would not ensure a commensurate decrease in the amount of old newspapers disposed of. As more newsprint producers attempt to buy old newspapers, their purchases could be offset by decreases in the use of old newspapers for non-newsprint domestic uses (such as paperboard) or for export. This offsetting could occur because the increased purchases of old newspapers by newsprint producers could drive up the price of old newspapers and discourage other uses.

Because a disposal-reduction credit system would specify an overall *recovery rate* rather than a *recycled-content* standard, the desired reduction in disposal would be achieved.

Cost to Industry and Consumers. If the industry does not achieve a 40 percent overall recovery, H.R. 3865 would require EPA to set a minimum recycled-content for newsprint and to consider the use of a credit system as a means of implementing it.

If a uniform recycled-content standard (that is, one with no credit system) were set, all newsprint manufacturers would need to comply with the minimum recycled-content requirements regardless of the cost to them. That would be the most expensive way of increasing the recycled-content of newsprint because it would not offer newsprint producers any flexibility.

If the Administrator chose to use a credit system to implement the minimum recycled-content requirement, the cost to industry and consumers would be reduced. Under this system, newsprint producers that face high costs for using recycled materials would be able to buy recycling credits from producers that have lower costs of using recycled materials.

A disposal-reduction credit system could further reduce the cost to industry and consumers. A key element in the system is that all major final users of old newspapers would have the opportunity to earn credits. That would not be the case if the policy set a minimum recycled-content standard (rather than an overall recovery rate) and implemented it with a credit system. Providing credit-earning opportunities for non-newsprint users is important because they may be able to expand their use at a lower cost than could newsprint producers. At present, 69 percent of all

old newspapers that are recovered in the United States is used in processes other than producing newsprint.

Enforcement. If the Administrator set a uniform recycled-content requirement as a result of H.R. 3865, the government would need to ensure that all domestically produced and imported newsprint contains the required amount of recycled materials. As indicated above, there are 19 domestic producers and over 900 importers of newsprint, and no easy method exists for verifying its recycled-content.

If the Administrator chose to implement the minimum recycled-content requirement by using a credit system, the government would need to ensure that producers and importers who did not meet the recycled-content standard had bought credits from producers or importers who exceeded the standard. Since it is difficult to determine the recycled-content of imported newsprint. It could be hard to verify whether importers should be purchasing credits or would be eligible to sell them. Importers are currently required to report who manufactured the newsprint. Information on the capacity of foreign producers to use recycled fibers, therefore, could be used as a crude check on importers' credit requirements.

Under a disposal-reduction credit system utilizing a overall recovery rate rather than a recycled-content requirement, the government would have to verify that all newsprint producers and importers have obtained the correct number of disposal-reduction credits. In addition, they would need to assure that the legitimacy of the credits--that one ton of old newspapers had been diverted from disposal for each credit obtained.

In order to determine the number of credits a firm should obtain, the government would need to know how many tons of newsprint it produced or imported. This information is already routinely collected by the Customs Service for each shipment of newsprint brought into the country. Verifying the credit requirements of importers, therefore, should be relatively easy.

Verifying the legitimacy of credits earned would be the biggest implementation challenge. If only major final users of old newspapers were able to earn credits, approximately 130 domestic firms plus exporters would be eligible (see Table 3). If minor final users of old newspapers were also able to earn credits, the number of domestic firms covered by

the policy would grow considerably. Verifying the quantities exported would be relatively easy because this information is currently reported to the U. S. government. Verifying the quantities used by domestic firms could be more difficult. End users might be required to maintain receipts of old newspapers purchased from collectors or intermediaries. In some cases, such as newsprint and tissue production, the use of old newspapers in production requires the use of capital equipment to remove the ink. The presence or absence of this deinking equipment could serve as a crude check on a firm's ability to use old newspaper and therefore earn credits.

Benefits and Costs

Either a disposal-reduction credit system or H.R. 3865 would reduce disposal of municipal solid waste, but both would involve social costs. These costs include higher prices for newspapers and administration costs. The total costs borne by industry, consumers, and the government should be weighed against the benefits such a policy would yield.

CONCLUSIONS

The disposal-reduction credit systems described in this memorandum offer two advantages over technology-based approaches. First, they provide an assurance that disposal will be reduced by the desired amount. Second, they can bring about reductions in disposal at a lower cost to industry and consumers than can be achieved with technology-based approaches. Technology-based approaches prescribe which firms will reduce waste and the technologies to be used. Under disposal-reduction credit systems the government sets the overall reduction goal, but lets market forces determine the least costly means of meeting this goal.

Both disposal-reduction credit systems and technology-based approaches can have significant enforcement costs. A potential disadvantage of a credit system is that its administrative costs can exceed those of a technology-based approach in some cases. The cost of administering a credit system depends on the size and structure of the industries involved. The cost will tend to be higher when there is a large number of firms that make the product that a credit system is applied to and when there are a large number of firms that can reuse the product.

Both the costs and benefits should be examined for either a technology-based policy or a credit system. The total costs include the costs to industry and consumers and the administrative costs. These total costs can be large and will vary greatly among items based on the size of the industries involved and the technological opportunities to reduce the weight of the items or increase their recovery rate. The benefits will vary based on the amount and type of materials that are diverted from disposal.

Provided that their administrative costs are not too high, credit systems are more likely to have positive net benefits (i.e., benefits that exceed costs) than technology-based approaches because of their lower costs for industry and consumers. Because the costs and benefits of credit systems are likely to vary greatly when applied to different items in the waste stream, however, these types of policies are likely to yield positive net benefits only when they are applied to carefully selected items. Such items might include toxic, hard to dispose of, or particularly large volume items.