The Impact of Restricting Beverage Container Use in Iowa

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Abstract

Many states and municipalities have considered measures that would restrict the types of beverage containers that could be used by their citizens. This type of legislation was introduced 1,051 times in state legislatures between 1969 and 1975. Vermont and Oregon have container legislation in effect, and Vermont's law will become more stringent in 1977. California, Minnesota, South Dakota, and Virginia have enacted container laws that will take effect in the next two years. The citizens of Maine and Michigan approved container measures in referenda held in November, 1976.

Iowa has considered beverage container legislation in several recent General Assemblies. The measure as proposed in the 1976 session of the Iowa legislature, HF797, HF413 or SF275, would have placed deposits of two to five cents on all beverage containers, set up a mechanism for redeeming bottles, and prohibit pop top cans.

In this study, the sections of the Iowa economy that would be impacted by container legislation were analyzed and a number of conclusions were drawn.

Soft Drink and Beer Consumption in Iowa

Iowans drink 24.6 gallons of soft drinks and 21.3 gallons of beer per capita per year. About 21 percent of the soft drink sold in Iowa is sold in bulk. The remainder is sold in returnable bottles (48.2 percent), nonreturnable bottles (9.4 percent),

and nonreturnable cans (21.4 percent). The beer Iowans drink is sold in kegs (15.0 percent), returnable bottles (2.1 percent), nonreturnable bottles (12.8 percent) and nonreturnable cans (70.1 percent). Iowans use one billion beverage containers each year.

Impacts of an Iowa Bottle Bill on the National Economy

Iowans are not engaged in the energy-intensive manufacture of beverage containers, where most employment impacts will be felt. If beverage cans were prohibited, approximately 720 jobs in the metal fabrication and can industries would be lost. If one-way bottles were prohibited, another 97 glass producers would lose jobs, although this unemployment would be delayed several years by the need to build an adequate stock of refillable bottles.

It must be emphasized that these job losses would not occur in Iowa, but in surrounding states.

Iowa Beer and Soft Drink Industry

Iowa has 34 soft drink bottlers and one brewery. These plants employ 1,576. The industry has centralized over the years. Today, five plants can drinks and ship them throughout Iowa. About 12 percent of the soft drink consumed in Iowa is imported from other states.

The impacts of this sector are not readily quantified. The canners might install new bottling lines, buy quantities of returnable bottles, and new delivery trucks. This increased capital expenditure would be offset by additional business at Iowa's bottling plants. It is highly probably that significant new employment would result in this sector of Iowa's economy.

Other Industries

Alcoa Aluminum in Riverdale, Iowa, produces a minimal amount of aluminum for beverage cans. Chemplex Company in Clinton produces polyethylene resin that is used to fabricate the plastic rings around 6-packs of nonreturnable cans.

In interviews with officials from Alcoa and Chemplex, neither could estimate any loss of employment from container legislation.

Grocery Stores

In Iowa, 2,156 retail establishments sell groceries and soft drinks. These stores would have to add staff to sort bottles. An estimated 379 new part-time jobs would be added in Iowa's grocery stores with container legislation. The expense of this increased employment would be between $985,000 and $1.8 million.

Wholesale Beverage Distributors

The 106 wholesale beer distributors would add from 240 to 336 new employees to their establishments for handling and delivering returnables.

Litter

National studies have indicated that roadside litter is composed primarily of paper (48.9 percent), beer cans (21.7 percent), soft drink cans (4.4 percent), returnable bottles (2.0 percent), nonreturnable bottles (3.5 percent) and miscellaneous items and containers (19.5 percent). It has been estimated that the beverage

container portion of roadside litter would decrease about 80 percent with a bottle bill. In Oregon, beverage container litter has decreased 83 percent, and total litter 39 percent.

The Iowa Department of Transportation spends between $350,000 and $400,000 each year for litter pickup. The DOT does not expect pickup expenses to decrease with container legislation.

Energy

Only a small portion of the energy needed to produce the beverages Iowans drink is actually consumed in Iowa. Only 9.5 percent of the 5.15 trillion BTU needed to produce the beer and soft drinks used in Iowa is actually consumed in Iowa.

A national savings of 2.62 trillion BTU would result with a switch to an all returnable beverage system in Iowa. This is equivalent to about 21 million gallons of gasoline per year. The amount of energy used in Iowa to produce beverages would increase 46.9 percent to 720 billion BTU with an all returnable beverage system. This is because the parts of the beverage system that are more energy intensive in a returnable system are performed in Iowa. This increase is insignificant when compared with the national savings.

Solid Waste

Iowans would save only a minimal amount of tax dollars for solid waste disposal if beverage container waste was eliminated. Over a long period of time, a decreased number of landfills would be put into operation in Iowa.

Consumer Impacts

Container legislation would benefit the consumer most. Some choice in container types might be forfeited. It is not likely that beverage costs would increase. Currently the cost of soft drinks in returnable containers is significantly lower than the cost of disposables.

The American consumer is ready and willing for restrictive container legislation to be enacted. Polls indicate that Iowans and Americans prefer beverages in returnable containers and will return the containers for deposits.

INTRODUCTION AND OVERVIEW

During the 1977 legislative session one of the pieces of proposed legislation will deal with limiting the sale of non-returnable beverage containers. The debate on this issue has been heated in states where such a measure is a law. It appears that American consumers are ready to support a "bottle bill."[1] This legislation has the strong support of environmental groups as a method of decreasing energy and natural resource use, litter and solid waste. The beverage industry denounces this type of measure because it feels litter problems can be handled more effectively by recycling used containers. Nonreturnable containers are both bottles and cans that are disposed of instead of returned for deposit. In a returnable system, the consumer rents the bottles. In a disposable system, the consumer purchases the containers. Disposable bottles weigh and cost about half as much as returnable ones.

Nonreturnable beverage containers have been part of American life since the late forties, when the steel industry began to view the soft drink and beer industries as a last major market area for expanding the use of steel cans. At that time, returnable bottles averaged 40 trips, as compared with nine to 12 trips today. Aluminum beer cans entered the market in the middle to late fifties and since that time, aluminum has replaced the steel in can tops to facilitate opening.

Today, beer and soft drink containers constitute about one-half of all beverage and food containers sold.[2] From 1958 to 1970, beverage consumption rose by a factor of 1.6, while beverage container use rose 4.2 times during the same period.[3]

The nonreturnable container is preferred generally by the male consumer who is more willing to sacrifice cost advantages for convenience. Nonreturnables cost from 30 to 90 percent more than beverages in returnable containers. On the other hand, the housewife, who does her shopping by automobile and is more cost-conscious, generally prefers returnable containers. In Iowa, almost all the beer sold in packages is sold in nonreturnable containers, while only 38.9 percent of the packaged soft drinks are sold in disposables. This is primarily because of the difference in consumer preferences for the packaging.

With the advent of disposable beverage containers, concern for littering problems grew. The industry reacted by forming an organization to combat litter through public awareness, "Keep America Beautiful." The Can Manufacturer's Institute, the Glass Container Manufacturers Institute, the U.S. Brewers Association and the National Soft Drink Bottlers Association are all members of KAB, which conducts massive anti-littering advertising campaigns. The industry favors container recycling over prohibition of nonreturnable containers. The aluminum industry in particular is hoping to achieve a 50 percent rate of recycling of all-aluminum cans by 1980.[4]

Other groups have supported restrictive legislation similar to the measures being proposed in Iowa. The first restrictive law was passed in Vermont in 1953. This measure banned nonre-

turnable beer bottles in an effort to reduce littering. This law expired in 1957 and was not renewed because the volume of litter was unaffected. By 1972, over 350 restrictive bills had been introduced in Congress, state legislatures, and local jurisdictions.

During the second session of the ninety-third Congress Senator Hatfield introduced a measure modeled on the Oregon law. The bill died in committee. Also, the U.S. Environmental Protection Agency recently promulgated regulations that would prohibit use of nonreturnables in federal installations. Three states have container legislation currently in force. The Oregon bill went into effect in 1972, a more recent Vermont measure was enacted in 1973, and Minnesota's ban on detachable tops enacted in 1973 became effective on January 1, 1977. In addition, South Dakota, Virginia, and California have enacted container legislation that will go into effect in 1978 and 1979.

In Iowa, bottle legislation has been introduced during the past three General Assemblies. The major provisions of the most recent Iowa bill HF797, introduced on 23 April 1975 by the Committee on Energy are as follows:

1. All beverage containers have deposit values. If a container is reusable by more than one manufacturer, the container is certified and has a deposit value of two cents. If the container is not reusuable, its deposit value is five cents.
2. Retail outlets must accept container of the kind, brand and size they sell and exchange them for a refund value.

3. The refund value of the container must be clearly marked. However, certified glass containers are not required to be so marked.
4. Redemption centers at which consumers may return empty beverage containers for deposits may be set up by anyone.
5. Snap top cans are prohibited.
6. The administration of the bill, including the certification of containers and redemption centers will be handled by the Iowa Beer and Liquor Control Department.

Similar measures have been introduced in the Iowa municipalities of Des Moines and Iowa City.

This study is an attempt to identify the sectors of the Iowa economy that will be impacted by container legislation. No sophistifacted economic techniques have been employed because any projections will be faulty at best. An overview of the issue is presented as well as detailed analysis of the involved sectors of Iowa's soft drink distribution system.

SOFT DRINK AND BEER CONSUMPTION IN IOWA

Per capita consumption of soft drinks in Iowa is 24.6 gallons/year.[5] This is 8.9 percent below the national average.[6] Data is not available on the types of containers in which Iowa's soft drinks are served, but spot checks in supermarkets and soft drink distributors indicate that container trends in Iowa follow those of the West-Central region of the U.S. On this basis, 21 percent of the soft drink sold in Iowa is sold in bulk. The remainder is sold in returnable bottles (48.2 percent), nonreturnable bottles (9.4 percent), and bimetallic 12-ounce cans (21.4 percent).[7] Soft drinks are sold in approximately 451.2 million containers. Eighty-seven percent of the soft drinks consumed in Iowa is produced in the State.[8]

Per capita consumption of beer in Iowa is 21.3 gallons/year,[9] exactly the national average.[10] Fifteen percent of the beer consumed in Iowa is sold in kegs; the remainder is in 562.1 million containers, almost all of which are nonreturnable.[11] Almost all of the beer consumed in Iowa is shipped from out of state.

Consumption of soft drinks and beer has continuously increased in Iowa and the U.S. over the last ten years. In 1974, for the first time in twenty years, soft drink consumption in the U.S. fell slightly, by 0.9 percent.[12] The major reason for

this was the tremendous increase in sugar prices.* However, in Iowa this trend was negated by a dramatic increase in diet soft drink sales, from less than one percent of an average grocery store's soft drink business to more than ten percent of its sales.[13]

Opponents of container legislation feel that a prohibition on nonreturnables would seriously decrease sales of soft drinks, especially sales of "private label" beverages, and thus hurt the consumer. Oregon experienced a 1.38 percent increase in beer sales the year after their measure was passed.[14] This was less than the historical annual rate of increase of 5.67 percent. In 1974, the historical annual rate of increase in beer sales was again reached.[15] No good data is available on soft drink consumption in Oregon, but one study indicates it increased ten percent in 1973 over the 1972 levels.[16]

Opponents also have argued that prices paid for beverages would increase. Soft drink prices in Oregon rose no more than in the bordering state of Washington. Beer prices rose slightly in Vermont and Oregon. Oregon's prices remain two-to-three percent higher than those in Washington, but this price differential cannot be attributed entirely to container legislation.

* It is worthwhile to note that prices of both beer and soft drinks on a national scale have risen in the past year.

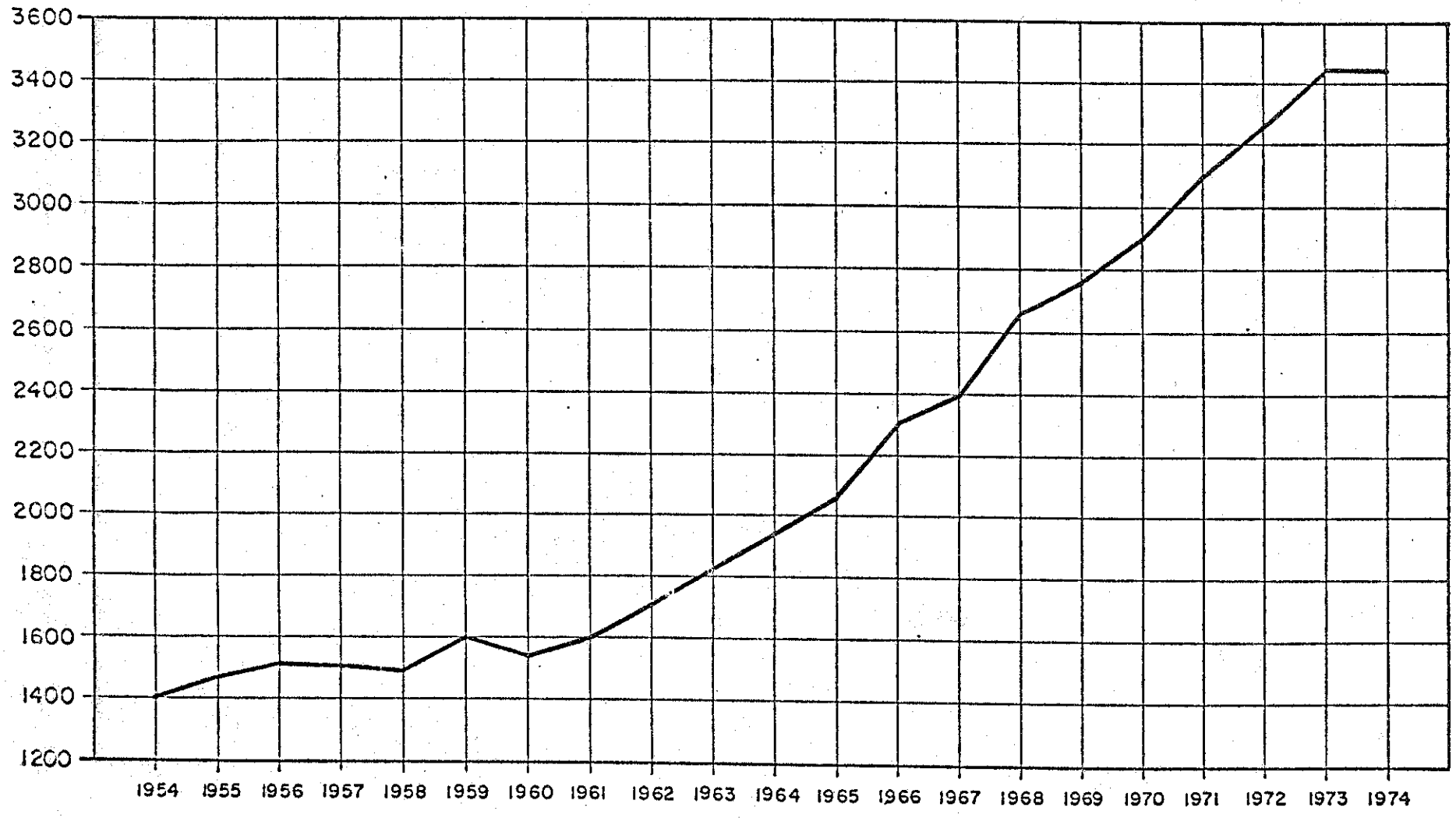
Iowa Soft Drink Sales

		Million Gallons	Percent
I.	By: Type of Package		
	A. Bulk	14.7	21.0
	B. Packaged		
	1. Returnable bottles	33.8	48.2
	2. Nonreturnable bottles	6.6	9.4
	3. Cans	15.0	21.4
		70.1 million gallons	100%
II.	By: Place of Sale		
	1. Food Stores	38.6	55.0
	2. Vending Machines	14.7	21.0
	3. Other Retail Stores	9.8	14.0
	4. Other	7.0	10.0
		70.1 million gallons	100%
III.	Iowa Beer Sales		
	A. Kegs	9.1	15.0
	B. Packaged		
	1. Returnable bottles	1.3	2.1
	2. Nonreturnable bottles	7.8	12.8
	3. Cans	42.6	70.1
		60.8 million gallons	100%

Source: National Soft Drink Association. 1974 Sales Survey of the Soft Drink Industry.

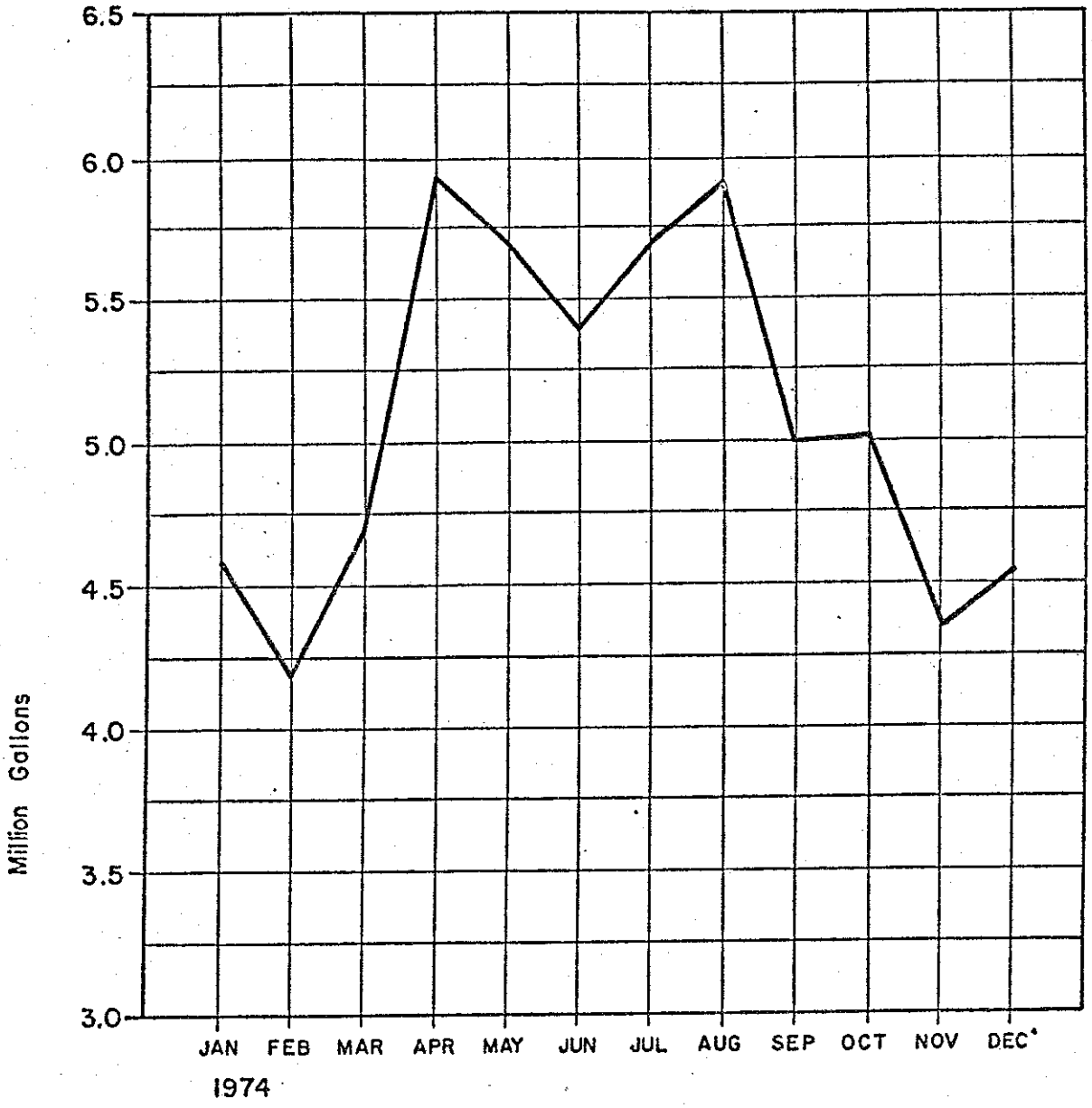
Iowa Wholesale Beer Distributors Association. Monthly Beer Shipments.

Per Capita Soft Drink Consumption in the United States, 1954-1974.



Source: Beverage Industry Annual Manual, 1975-76

Beer Sales in Iowa, 1974



Source: Iowa Wholesale Beer Distributors

IMPACTS OF AN IOWA BOTTLE BILL ON THE NATIONAL ECONOMY

Iowans are not engaged in the energy intensive manufacture of beverage containers. However, container legislation passed in Iowa would have a slight impact upon national employment. The U.S. Department of Commerce has estimated that a national bottle bill would decrease U.S. employment 22,000 persons in bottle manufacturing, 35,000 in can manufacturing, and 25,000 in metals and fabrication. This loss of 82,000 jobs would be offset by an increase of 95,000-115,000 jobs in the retailing and bottling sectors.[17]

Iowans used about 580.4 million beverage cans, or 1.3 percent of total U.S. beverage can production in 1974.[18] Thus, if the number of beverage cans used in Iowa would decrease from 57.3 percent to 4.4 percent, as occurred in Oregon,[19] the result and effect of the Iowa legislation on national employment in the metal fabrication and can industries would be the loss of 720 jobs.

About 137.7 million nonreturnable beverage bottles are used in Iowa per year. If these left the distribution system, about 97 glass producers would lose jobs. However, the need to build a "float" (refillable bottles that have been purchased by the consumer and are somewhere between that point and the point at which they are refilled) will delay job losses by two to three years, depending on the rate of transition.

Increases in employment related to container legislation would occur in Iowa, in the retail and wholesale sectors of the beverage industry. The national decrease of 817 jobs in container manufacture would be offset by an increase of 190 full-time equivalent jobs in grocery stores, 240 to 336 jobs with beer distributors, and a number of jobs in the soft drink industry. Labor unions contend that the jobs lost have hourly rates of $5 to $6 per hour as compared with $2.50 to $4.50 per hour in retailing.[20]

Impacts On The Iowa Economy

Beer And Soft Drink Industry

Iowa has 34 soft drink bottlers and canners and one brewery. These plants employ 1,576, and are located in eighteen Iowa cities. Over the years the industry has tended to centralize. In 1951 there were 116 soft drink bottlers and three breweries in Iowa, many located in small towns such as Garnavillo, Decorah, and Albia.[22] Today, Iowa's major cities supply soft drinks for the entire state. Iowa's bottlers also distribute soft drinks to retail outlets.

Of the thirty-five plants, only five can beverages (Mid-Continent Bottlers in Des Moines, Mahaska Bottlers in Oskaloosa, Coca-Cola Bottling in Ottumwa, Pickett Breweries in Dubuque, and Chesterman Company in Sioux City). These companies receive cans from plants in Hammond, Indiana and Rockford, Illinois, fill them, and place steel bottoms on them. The lighter cans can be transported longer distances with less transportation fuel. Some canned beverage is transported into the state from canning plants in Kansas City, Norfolk, Nebraska, and Watertown, Wisconsin. Large centralized plants in Chicago, Minneapolis, and Kansas City can "private label" soft drinks that are sold in grocery stores. About 12 percent of the soft drink consumed in Iowa is imported from other states.[23]

The only force opposing the centralizing tendency of the beverage industry is the franchising procedure used by the major

beverage companies. The franchises provide each bottler with an exclusive territory, which forces large food wholesalers to buy soft drinks locally. This processhas been an incentive for the food chains' private-label soft drinks.

The impact of a prohibition on nonreturnables would be greater on the five canning plants than on the 29 bottlers. These companies might be forced to purchase new bottling lines, higher-priced returnable bottles, and new delivery trucks. A ready market for the extinct canning lines would be out-of-state beverage producers. Pickett's Brewery in Dubuque, Iowa's only beer producer, feels restrictive container legislation would force them to close. Fifty-five percent of their sales are in canned beer. They recently installed a canning line and would have to spend $500,000 to install a bottler. The canner produces 440 cans per minute; the bottler either 105 or 280 per minute.[24]

The prices paid for beverage containers on 3 Febrary 1975 were as follows:

12 oz. bimetallic can	7.1¢
12 oz. returnable bottle	9.9¢
12 oz. nonreturnable bottle	4.8¢
16 oz. returnable bottle	10.0¢
32 oz. returnable bottle	11.8¢

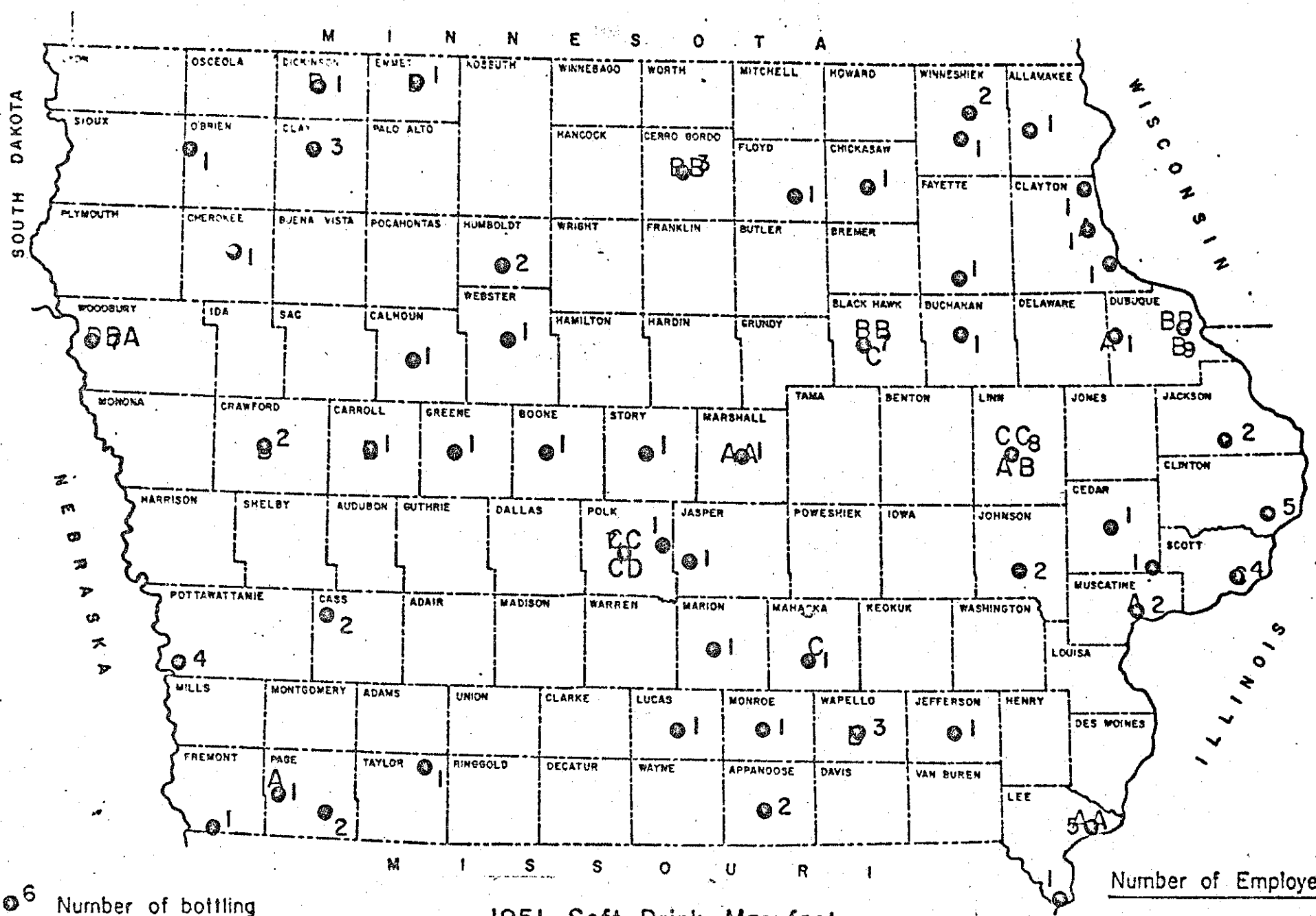
Source: Beverage Industry Annual Manual 1975-76, p. 64.

The economic feasibility of returnable bottles is dependent upon trippage rate, or the number of times bottles are returned to the bottler for refilling. It is difficult to estimate how many times bottles are returned in Iowa. A study in Minnesota indicates in that state soft drink containers are returned nine times and beer bottles 12 times.[25] From an energy standpoint a returnable bottle

must be returned eight times for the returnable system to consume less energy than a nonreturnable system. The bottlers estimate that a bottle must make 13 trips to be economically feasible.[26] In Oregon, trippage rate has increased to 20.[27] Pickett's feels that if trippage did increase, the brewery could remain economically viable with an all-returnable system.

Again, the Oregon experience serves to illustrate possible trends in Iowa if container legislation is enacted. New investment in the "float" of returnable bottles was $910,000. Increased costs for soft drink distribution were $881,000. In total, Oregon bottlers experienced an increase of $2.8 million during the first year container legislation was in effect.[28]

The beverage industry has become highly centralized as a result of the lightweight, easy to transport can. Four soft drink plants are centrally located in Iowa urban areas, and produce most of the canned beverages sold in the state. At the same time, the number of small, local breweries and bottlers has declined from 116 in 1951 to 35 today, a decrease of about 70 percent. Although a mandatory deposit law might work to the economic disadvantage of the five canners, even these establishments concede that a high rate of trippage, as has been experienced in Oregon, would allow their bottling lines to remain economically viable. The 30 plants that limit their function to bottling would be able to increase their sales volumes, add employees, and possibly add new plants. In Oregon, the small bottlers have experienced major growths in volume and employment. Iowa's "bottle-based" soft drink industry would probably follow that pattern.



●6 Number of bottling plants in city

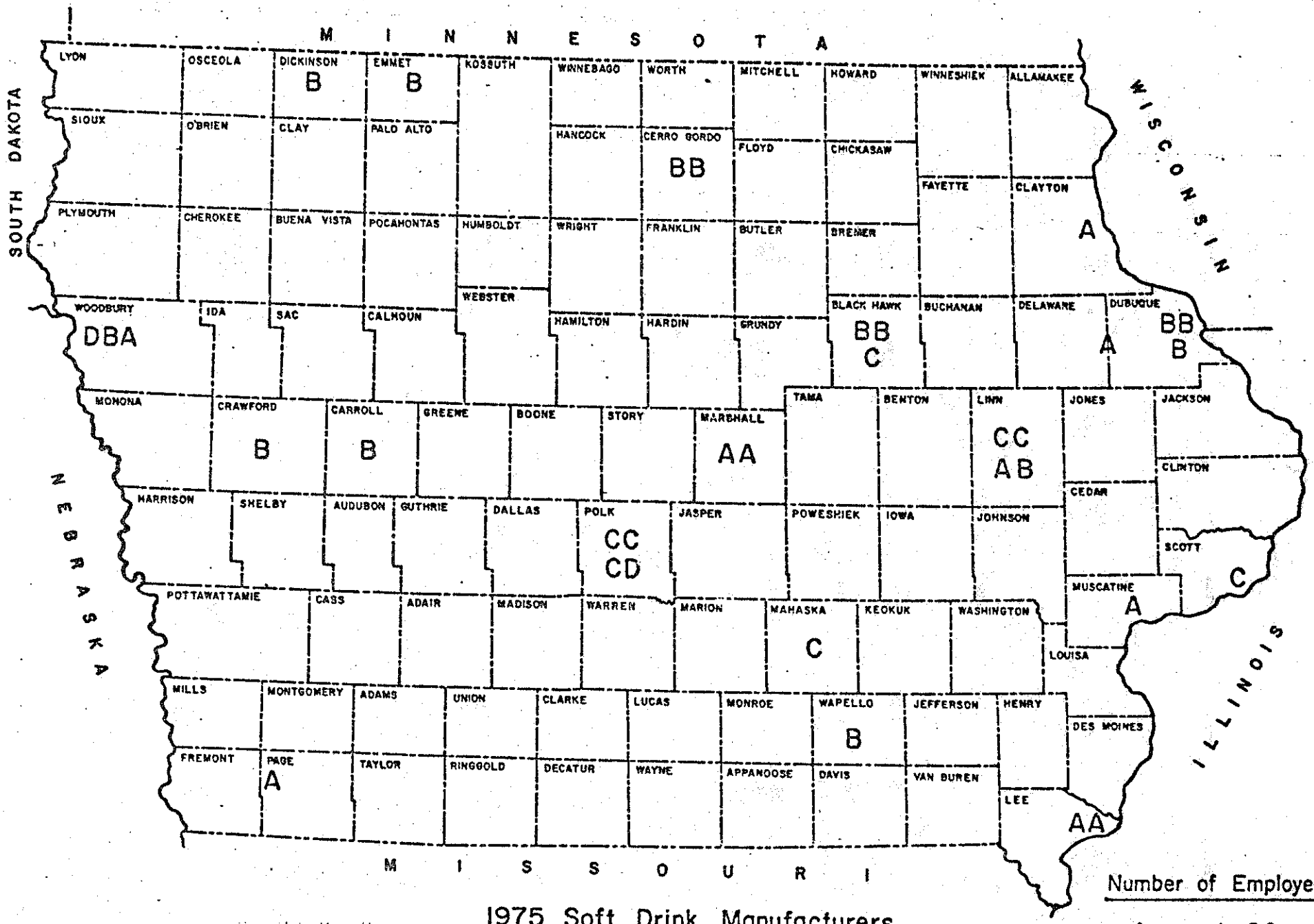
Source: Directory of Iowa Manufacturers

1951 Soft Drink Manufacturers

total - 116 soft drink plants

Number of Employees

A	1-20
B	21-50



1975 Soft Drink Manufacturers

total - 34 soft drink plants

Source: Directory of Iowa Manufacturers

Number of Employees

A	1-20
B	21-50

Other Industries

There are no industries in Iowa that manufacture cans, bottles or paper beverage carriers. Two Iowa industries are engaged in the manufacture of other beverage packaging. The Alcoa plant in Riverdale produces sheet aluminum that is used primarily for house siding and aviation. This plant produces a minimal amount of aluminum that is used for beer cans. Chemplex Company in Clinton produces polyethylene resin that is used to manufacture plastic milk bottles, the "rings" around 6-packs of nonreturnable cans, and a variety of other packaging materials.

The Alcoa system has two sheet rolling plants--the plant in Riverdale, Iowa and one in Evansville, Indiana. The production of beverage-can aluminum at these two plants is interreleated and neither can be examined separately. The Iowa plant has a peak employment of 3,200. The Evansville operation is a new plant designed specifically to roll can aluminum. The company tends to put most of its can business into the Indiana plant. The Iowa plant will manufacture can aluminum only if an excess of demand occurs. The total capacity of the Evansville plant is 60 to 80 million tons of aluminum per month. The capacity of the Riverdale plant is 50 million tons per month. In late 1975, the Evansville plant produced 60 million tons per month of can aluminum and the Riverdale plant produced 37.5 million

tons per month of sheet aluminum. The Riverdale plant was producing very little, if any, can aluminum.[29]

The impact of nonreturnable legislation on employment at Alcoa/Riverdale cannot be readily quantified. In peak periods, up to 20 percent of the plant's output may be can alumnium. However, all of this aluminum is shipped out of Iowa to be fabricated into beer cans which in turn are filled with beer outside the State. Container legislation that would decrease the demand for all-aluminum beer cans would probably result in greater shifting of Alcoa's can business to the more efficient Evansville plant, with slight unemployment possibly resulting in Riverdale.

Soft drinks sold in all-aluminum cans are not available in Iowa. The typical Iowa beverage can is the bimetallic three-piece, with steel sides and bottom and an aluminum top. However, several brands of beer are sold in Iowa in all-aluminum cans.

Chemplex in Clinton transforms liquefied propane gas and ethane into polyethylene resin, which is then formed into a variety of materials. Most of their business is in the packaging field. A minimal amount of their resin is used to fabricate plastic rings which are used to hold 6-packs of canned beverages together. The company does not aniticpate any unemployment due to container legislation. The greatest impact of such legislation would be on their future business.[30] A survey of new trends in the beverage industry indicates that plastic-coated nonreturnables are now being test-marketed and that a plastic bottle is being researched. Both of these products could be important in Chemplex's future business.

Grocery Stores

In Iowa there are 2,156 retail establishments that sell groceries and soft drinks.[31] There is a wide variety in sizes of grocery stores in the state. A store in Iowa City, judged to be typical was studied in detail. This store has sales that are almost at the middle of the sales range for the Hy-Vee chain.

About 15 percent of the total shelf space of the store is dedicated to sales of beer and soft drinks. Two-thirds of this shelf space is for returnables. Almost all beer is sold in non-returnables. Returnable beer is housed in a far corner of the storage room and must be specifically requested. Thirty-five to forty percent of the soft drink sales are in returnable containers. The store sells a private-label soft drink, in both diet and regular varieties, in cans and nonreturnable bottles. Private-label drinks account for 20 percent of their soft drink sales.

A ban on beverage cans would have two effects on grocery stores. The number of employees engaged in sorting bottles would increase 2 1/2 times, and the storage space devoted to bottles would have to be increased. The storage problem could be eliminated by more frequent pick-ups of empty bottles. More shelf space might have to be added, although this problem would be reduced by the use of the 11-ounce "stubby" beer bottle that is widely used in Oregon.

In the study store, it is estimated that increased labor

costs for sorting bottles would be $4,927 per year, or 1,095 person-hours per year. It is estimated that employees spend three hours per day sorting bottles. This would have to increase two and one-half times with the implementation of a ban on cans.

From this data, rough estimates can be made of total increased costs and additional employment in grocery stores. There are 719 grocery stores in Iowa towns with populations of 10,000 or more.[32] It is estimated that half of these or 360, would experience similar employment needs to those in the store studied. On this basis, total increased labor needs would be 394,200 person-hours per year at a cost of between $985,500 (based on beginning part-time employee wage) and 1.8 million (based on average wage). Bottle sorting is usually a part-time job. If it is assumed the additional employees would work 20 hours a week, 379 new part-time jobs would be created by container legislation.

Grocers have stated that bottle breakage would increase and sanitation would become more difficult with an increase in returnable sales. In the sample store, at least, conditions around returnable bottles were very clean and no breakage problems were evident.

In Oregon, grocers' labor costs increased 2.7 million. A small amount of additional storage was added, and grocers made in new investments in shelf space and sorting devices. The bill did not impact on other retail outlets that sell beverages such as restaurants and taverns.[33]

Wholesale Beverage Distributors

In Iowa, the most severe impacts of container legislation will probably occur among the retail grocery stores and wholesale beverage distributors. These establishments will have to hire additional employees to handle and transport bottles and may make some capital expenditures for bottle handling equipment and trucks.

There are 106 wholesale beer distributors in Iowa. These establishments employ 800. Another 136 establishments distribute groceries, and some of these handle soft drinks.[34] Many of Iowa's bottlers are also beverage distributors. The beer distributors receive beverages from large manufacturers, primarily in Wisconsin, and sell and deliver beer to retailers. The distributors also redeem returned containers from the retailers and ship them back to the brewers.

In Iowa, beer is sold in 454.4 million cans and 83.7 million nonreturnable bottles annually. Returnables require about twice as much space as nonreturnables, although this problem has been alleviated in Oregon by the introduction of the 11-ounce "stubby" bottle that is similar in size to a beer can.

Oregon has estimated that handling returnables costs about 10.3 cents per case more than handling cans. These increased costs have been offset by a premium paid for the return of certified bottles. Oregon and Iowa have a similar number of beer

wholesalers.[35] If the Oregon experience is applied to Iowa, an increase of $495,550 in costs can be expected by the distributors with the enactment of container legislation. Most of this will be for increased warehouse and truck-driver labor. About 1.6 times more labor is needed to handle returnables than nonreturnables.[36] On that basis, Iowa's wholesale beer distributors would have to add between 240 and 336 new employees to handle the increased numbers of returnable bottles.

IMPACTS ON LITTER

Mandatory deposit legislation has as a major purpose the reduction of litter. One of the few uncontested results in Oregon has been the reduction of beverage container litter. Mandatory-deposit legislation attempts to reduce litter by giving refund values to beverage containers, thus encouraging return of the containers and increasing public awareness of the total litter problem.

The Iowa Department of Transportation does not analyze the contents of the roadside litter collected by their maintenance division. Therefore, national averages and the experiences in other states must be adapted to Iowa to assess the impacts of mandatory deposit legislation.

The best information available on the quantity and composition of roadside litter is a study performed by the Highway Research Board in 29 states in 1969. Ten highway segments, each two-tenths of a mile in length, were examined in each state. One cubic yard of litter was accumulated per month, on the average, for a mile of interstate or primary highway. The composition of roadside litter, by pieces was found to be:

paper	48.9%
beer cans	21.7
soft drink cans	4.4
other cans	2.3
plastics	4.7
returnable beverage containers	2.0
nonreturnable glass containers	3.5
other bottles	1.4

miscellaneous	11.4
	100%

Source: Highway Research Board, National Study of the Composition of Roadside Litter, 1970.

Notice the large percentage of beer cans that are discarded compared to soft drink cans.

The only data on roadside litter in Iowa comes from a one-mile survey performed by the Iowa Student Public Interest Reseaech Group in October, 1974 on a heavily traveled stretch of Highway 69 near Ames. In this survey, nonreturnable containers were found to constitute 30 percent of all items of litter. Twenty-two percent of the litter, by item, was beer cans; this correlates closely with the national figures.[37]

The reduction of litter in Oregon brought about by the law against nonreturnables has been widely acclaimed. The most recent litter study was performed in September, 1974, two years after the legislation was enacted. Beverage container litter had decreased 83 percent, on an item basis, and total litter decreased 39 percent.[38]

The Iowa Department of Transportation spends between $350,000 and $400,000 each year for litter pickup. In fiscal year 1975, litter pickup cost Iowans $358,388.[39] Litter is collected once a year along all roads in Iowa, usually in the spring, and is collected sporadically throughout the rest of the year. The DOT does not feel that a reduction in litter would reduce their litter pickup expenditures, since the same miles would have to be covered. A slight reduction in time spent on litter pickup would be possible.

Changes in Energy Use

On a national basis, the major impacts of container legislation are decreased use of energy and natural resources. The U.S. Department of Commerce has estimated that the country could decrease the amount of energy used in the beverage industry by 57 percent within several years of the enactment of container legislation.[40]

The current Iowa beverage system consumes 5.15 trillion BTU of fuels, or 1.1 percent of the total U.S beverage industry's use of energy. Only 490 billion BTU, or 9.5 percent, of the energy used in Iowa's beverage system is actually consumed in Iowa.[41] This fuel is used primarily to bottle beverages and transport bottles and empties.

Four beverage systems were compared in this analysis:

1. The current system
2. The current system with 30 percent glass recycling
3. An all-returnable system
4. An all nonreturnable system

A glass recycling loop (remelting the old glass and making new bottles) would actually consume slightly more energy than the current system does. This occurs because of the additional energy used in sorting and hauling the recycled glass.

A significant decrease in the energy used in the U.S in producing Iowa's beverage system would result with a switch to an all-returnable system. More than 2.5 trillion BTU of fuel would be saved by such a switch. This is the equivalent of 21 million gallons of gasoline per year. The benefits of this decrease in

energy use would not be felt in Iowa because Iowans are not engaged in container manufacture, the area where most energy is expended. Bottling and transport of finished beverages are the only parts of the system that occur in Iowa. Both of these operations are more energy-intensive in a returnable bottling system than in a nonreturnable one. Bottles weigh about as much as the beverage they contain, but a can for a 12-ounce beverage weighs only .05 pound. About four and one-half times more energy is needed to transport returnable bottles than to move cans. The bottling process is more energy intensive than is canning, because of the heat expended in washing and sterilizing bottles.

Energy consumed in the beverage system within Iowa would increase with a returnable system by 230 billion BTU, or 46.9 percent over current levels. This is the equivalent of 1.19 million gallons of gasoline, enough to keep 2,375 automobiles on the road for a year. This is a minimal increase when compared with the benefit that would accrue to the nation from an all returnable system.

One caution must be applied to examination of the energy savings in an all-returnable system: unless the bottles are returned 70 percent of the time, more energy will be consumed than in a nonreturnable system. However, this minimum has been easily achieved in Oregon, where bottles are returned at least 95 percent of the time.[42]

If Iowa used all throwaways the U.S. would consume an additional 1.28 trillion BTU, the equivalent of 10.2 million gallons of gasoline. This fuel could keep 13,250 automobiles on the road for one year.

Comparison of Energy Use in Soft Drink Systems

1. Comparison of returnable, nonreturnable glass, and cans.

energy use (B.T.U/gallon)

		returnable (8 fills)	glass non-ret.	non-ret. cans
1.	material acquisition	NI* 900	4,720	33,529
2.	transport	NI 125	650	253
3.	container manufacture	NI 7,740	40,625	3,358
4.	crown or lid manufacture	NI 1,935	1,935	15,960
5.	transport to bottler	360	1,895	206
6.	bottling	5,400	5,400	1,750
7.	paper container manufacture	NI 7,140	7,820	3,100
8.	transport to outlet	3,515	1,830	(in#6)
9.	collection & hauling of waste	90	470	110
	Iowa	9,365	9,595	2,066
	non Iowa	17,840	55,750	56,200
	TOTAL	27,205	65,345	58,266

2. Energy use under four container alternatives (Trillion B.T.U.).

		Total Energy Use	Iowa Use	Non Iowa Use
A.	current system	2.22	0.41	1.81
B.	present system w/30% glass recycling	2.28	0.41	1.87
C.	all returnables	1.51	0.52	0.99
D.	all non returnables	3.42	0.33	3.09

3. Percent change in energy use with optional systems over current system.

		Total Energy Use	Iowa Use	Non Iowa Use
1.	current system	--	--	--
2.	present system w/30% glass recycling	+2.7%	0.0	+3.3%
3.	all returnables	-32.0%	+26.8%	-45.3%
4.	all non returnables	+54.1%	-19.5%	+70.7%

*NI indicates energy utilized to produce beverages outside of Iowa.

Comparison of Energy Use in Beer Container Systems*

energy use (B.T.U./gallon)

			returnable (19 fills)	glass non-ret.	non-ret. cans
1.	material acquisition		NI 335	4,225	33,529
2.	transport		NI 45	575	253
3.	container manufacture		NI 2,865	36,210	3,358
4.	crown or lid manufacture		NI 2,580	2,385	15,960
5.	transport to bottler		NI 130	1,690	206
6.	bottling		NI 4,975	1,525	1,345
7.	paper carrier manufacture		NI 4,900	10,560	3,100
8.	transportation to outlet		I 3,780	2,230	420
9.	collection and hauling		I 30	400	100
	of waste	Iowa	3,810	2,630	520
		non Iowa	15,830	57,170	57,751
		TOTAL	19,640	59,800	58,271

Energy use under four container system alternatives (trillion BTU).

		Total Energy Use	Iowa Use	Non Iowa Use
A.	current system	2.93	0.076	2.85
B.	present system w/30% glass recycling	2.97	0.076	2.89
C.	all returnables	1.02	0.20	0.82
D.	all nonreturnables	3.01	0.030	2.98

Percent change energy use with optional systems over current systems.

		Total Energy Use	Iowa Use	Non Iowa Use
1.	current system	--	--	--
2.	present system w/30% glass recycling	+1.3%	0.0%	+1.4%
3.	all returnables	-65.2%	+163.2%	-71.2%
4.	all nonreturnables	+2.7%	-60.5%	+4.6%

*Picketts' Brewery in Dubuque has not been included in the calculations for bottling. The company produced and sold to Iowans 3,160,000 cans and 182,804 bottles of beer in 1974. Energy used in this production in Iowa was 1.73 billion B.T.U. for bottling and another .076 billion B.T.U. for transport of containers to bottler. This is the equivalent of .06% of the energy used to produce Iowa's beer system.

Energy Savings in Beer and Soft Drink Systems

1. Energy use under four container alternatives (10^{12} B.T.U.).

		Total Use	Iowa Energy Use	Non Iowa Use
A.	current system	5.15	0.49	4.66
B.	present system w/30% glass recycling	5.25	0.49	4.76
C.	all returnables	2.53	0.72	1.81
D.	all non returnables	6.43	0.36	6.07

2. Energy savings (-) or increases (+) in each system as compared with current system (Trillion B.T.U.).

		Total Use	Iowa Use	Non Iowa Use
A.	current system	--	--	--
B.	present system w/30% glass recycling	+.10	0.0	+.10
C.	all returnables	-2.62	+0.23	-2.85
D.	all non-returnables	+1.28	-0.13	+1.41

3. Percent change in energy use with optional systems.

		Total Use	Iowa Use	Non Iowa Use
A.	current system	--	--	--
B.	present system w/30% glass recycling	+1.9%	0.0%	+2.1%
C.	all returnables	-50.9%	+46.9%	-61.2%
D.	all non-returnables	+24.9%	-26.5%	+30.3%

IMPACTS ON SOLID WASTE

About three percent by weight of the solid waste discarded in Iowa is beverage containers. As beer and soft drink consumption rises, container litter also increases. As the quantity of solid waste generated each year increases, local governments are faced with the serious problems of finding adequate landfill sites.

Iowans pay $80 million each year to collect and dispose of solid waste. If restrictive container legislation were passed, Iowa tax payers could save a small amount on collection costs.[43] Because beverage containers are only a small portion of solid waste, collection routes and equipment would not over the short run respond to slight changes in the quantity of wastes discharged.

CONSUMER IMPACTS

Any type of container legislation will have the most beneficial impact on the beverage consumer, through lower prices. Iowa and national opinion surveys and the results of recent referenda indicate that the American beverage consumer would support legislation that would prohibit the use of nonreturnable containers.

Of the four referenda held in 1976, those held in Michigan and Maine passed by wide margins. The referendum in Massachusetts was defeated by less than one percent. The citizens of Colorado turned down a similar measure by a ratio of two to one. (See table A). The results of these referenda can be compared to the results in state legislatures. Between 1969 and 1975, 1,051 container bills were considered in state legislatures.[44] Only seven passed. (See table B). It appears that when a consumer has a chance to vote on a container measure, he is more likely to support it than his legislator is.

A January 11, 1976 Iowa Poll asked Iowans whether they would favor legislation banning the use of all nonreturnable bottles and cans.[45] (See table C). Seventy percent of all Iowans responded favorably. Men were slightly more favorable than women. Eighty percent of all rural residents surveyed favored such a measure.

The results of the Iowa Poll correspond to those obtained by the Federal Energy Administration.[46] The FEA survey indicated that 51 percent of the public prefer to purchase soft drinks and beer in returnables. The study found that people buying returnables do so to save money or out of concern for the ecology. Can buyers are willing to pay more for the greater convenience, and if container legislation were enacted, would probably prefer to pay a high deposit for the convenience of cans.

The FEA found that both beer and soft drink purchasers would return containers if deposits were placed on containers. Only seven percent of beer drinkers and eight percent of soft drink users would decrease their consumption with a ten-cent deposit per container. Eighty-six percent of beverage consumers would return their bottles for a ten-cent deposit.

Opponents of container legislation claim that such laws would increase consumer costs, decrease consumer choice, and decrease beverage sales. Currently, Iowa City residents pay much less for beverages in returnable containers than they do for canned beverages. A survey of Iowa City groceries indicates that consumers pay 1.7 to 1.9 cents per ounce for canned brand name soft drinks and 0.9 cents per ounce for an eight-pack of returnable, brand-name beverages. (See table D). Even canned "private label" soft drinks are not a bargain, since they average 1.3 cents per ounce.

Soft-drink prices in Oregon are four percent lower than those in Washington and beer prices are 2.4 to 3.7 percent

higher.[47] Soft drink sales increased ten percent in 1973 over 1972 levels in Oregon. Beer sales increased about 1.38 percent in 1973 over the year before.[48] A study of Oregon indicates that consumers there actually paid $75,000 less for the same quantity of beverage they purchased in 1972.[49] This statistic contradicts every argument made by opponents of the measure.

The consumer stands to benefit from lower beverage prices if container legislation is enacted. The decrease in container litter will be an aesthetic benefit. The consumer will sacrifice some choice in the types of container he may purchase, but results of the Iowa Poll indicates that Iowans are willing to make that sacrifice.

Table A

Results of State Referenda on
Nonreturnables, November 23, 1976

State	Vote (%)		Provisions of bill
	YES	NO	
Colorado	33	67	All beer and soft drink containers to be reusable, 5¢ deposit.
Maine	58	42	Ban on pop tops and plastic loops, 5¢ deposit.
Massachusetts	49.6	50.4	Ban on pop tops, 5¢ deposit on containers less than 32 oz, 10¢ deposit on containers more than 32 oz.
Michigan	64	36	Ban on pop top, 10¢ deposit on all beer and soft drink containers, 5¢ deposit on all certified containers.

Source: U.S. Brewer's Association, Inc.

Table B

States Which have Enacted Container Legislation

State	Effective Date	Provisions of the Law
California	1/1/79	Ban on pop top beverage containers.
Minnesota	1/1/77	Ban on detachable top beverage containers.
Oregon	10/1/72	At least 5¢ deposit on beverage containers, 2¢ deposit on certified containers, ban on pop tops.
South Dakota	1/1/78	Only recyclable or biodegradable containers allowed.
Vermont	1/77	Mandatory deposit of not less than 5¢ on all beverage containers, ban on plastic rings unless biodegradeable, only bottles that can be refilled at least 5 times may be used.
Virginia	1/1/79	Tax for litter control of $2.50 on each person engaged in the manufacture, wholesale, or retail of goods.
Washington	5/21/71	Litter assessment of 1.5/100 of 1% of $ value of products produced in the State and of $ value of gross proceeds from sales in the State.

Table C

Results of the Iowa Poll on Nonreturnable Containers, January 11, 1976

Question: Do you think nonreturnable bottles and cans are a serious litter problem?

	all Iowa	male	female	metro.	city & town	rural
YES	84%	81	87	82	85	86
NO	13	16	10	15	12	14
UNDECIDED	3	3	3	3	3	0

Question: Would you favor banning the use of all nonreturnable beer and soft drink containers in Iowa?

	all Iowa	male	female	metro.	city & town	rural
YES	70	72	69	69	69	80
NO	20	19	20	22	20	12
UNDECIDED	10	9	11	9	11	8

Table D

Comparative Consumer Costs of Nonreturnable and Returnable Beverage Containers

Quantity	Price/ounce
Soft Drinks	
Nonreturnable 12-oz. cans	
Name brand	1.7-1.9¢
Private label	1.3¢
Diet NR 12-oz. cans	
Name brand	1.3-1.4¢
Private label	1.1¢
NR 28-oz. bottles	
Name brand	1.75-1.96¢
Private label	1.2¢
Returnable 16-oz./8 packs*	
Name brand	0.9-1.0¢
Returnable 10-oz./6 packs	
Name brand	1.3-1.45¢
Returnable 32-oz.	
Name brand	0.9-1.0¢
Beer	
NR 12-oz. cans	
6 pack	1.9-2.2¢
12 pack	1.9-2.5¢
Returnable 12-oz. bottles	
24 pack	1.7-2.1¢
NR 7-oz. bottles	
8 pack	2.4-2.5¢
NR 12-oz. bottles	
6 pack	1.8-2.3¢

*Returnable prices do not include bottle deposits.

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