

# INSTITUTE OF ECONOMIC AND INDUSTRIAL RESEARCH

12-14, MITROPOLEOS STREET · ATHENS. 126 · TEL. 32 30 466 - 8 · P.O BOX 1703, PL. SYNTAGMATOS

SECTORAL RESEARCH AND INTELLIGENCE UNIT

RESEARCH TEAM : PACKAGING MATERIALS

SECTORAL REPORT 1981

- Glass Containers
- Metal Cans
- Corrugated Fibreboard Cases

November 1981

C Institute of Economic and Industrial Research, 12-14 Mitropoleos St., Athens, 126, Greece, 1981.

#### FOREWORD

This is the first Sectoral Report produced by the PACKAGING MATERIAL RESEARCH TEAM of the IOBE'S SECTORAL RESEARCH AND INTELLIGENCE UNIT (SRIU).

Products investigated by the Report are the following:

- Glass Containers
- Metal Cans
- Corrugated Fibreboard Cases

Topics covered include levels and the evolution of Demand and Production of the above products over time, the Greek Sector's productive capacity, certain issues associated with the distribution of production in the domestic as well as foreign markets and, finally, analysis of certain legal and institutional aspects of either national or EEC policy affecting the respective sectors' activity. Although the largest part of the Report aims at a detailed description of the prevailing situation (regarded as a prerequisite for all further sectoral analyses), a number of forecasts based on sectoral business sources has also been included in the Report. Such estimated and forecasts situation will be published in follow-up SRIU Sectoral Reports.

As indicated, this Report, being a Summary one, has been derived from a much more extended Greek original version in which comparative analyses of the sector's situation to that of respective sectors in other European countries have also been presented. Information on conditions for obtaining the original Greek Report is available from IOBE.

# CONTENTS

# I. GLASS CONTAINERS

1.	THE GLASS CONTAINERS MARKET IN GREECE	1
	1.1 Origin of demand and size of the market	1
	1.2 Levels and evolution of domestic glass containers production	4
	1.3 Qualitative attributes of greek glass containers.	6
2.	DISTRIBUTION AND MARKETING OF GLASS CONTAINERS IN	
	<u>GREECE</u>	7
	2.1 Tariffs imposed on imported glass containers in Greece	7
	2.2 Greek imports of glass containers	7
	2.3 Greek Glass Containers Exports	10
3.	GREEK GLASS CONTAINERS INDUSTRY'S PRODUCTIVE CAPACITY	13
	3.1 Major Enterprises in the Glass Containers Industry	13
	3.2 Regional Distribution of Productive Capacity	13
	3.3 Established productive capacity and its utiliza- tion rate	13
	3.4 Seasonality in glass containers production	16
	3.5 New investment in the glass containers industry	18
II.	METAL CANS	
1.	THE GREEK MARKET FOR METAL PACKAGING CANS	19
	1.1 Origin of demand and determining factors	19
	1.2 Demand for tinplate cans by the processed fruits and vegetables industries	19
	1.3 Demand for tinplate cans by the beer and soft- drinks industries	20
	1.4 An evaluation of the prospects for development of the domestic demand for tinplate cans	20
	1.5 Tinplate cans domestic production	21

Page

2.	PROE	DUCTIVE CAPACITY OF THE GREEK TINPLATE CANS	
	INDU	<u>JSTRY</u>	25
	2.1	Number of companies	25
	2.2	Regional distribution of producing units	27
	2.3	Established productive capacity and rate of utilization	27
	2.4	New investments in the greek tinplate containers industry	28
	2.5	Prospects for the Two-Piece Aluminium Cans in Greece	28
3.	RAW	MATERIALS FOR THE PRODUCTION OF TINPLATE CONTAINERS	30
	3.1	Types of Raw Material and Terms of Supply	30
	3.2	Factors Determining Tinplate Prices	31
	3.3	Tariffs imposed on Tinplate imported to Greece	31
III.	CORR	RUGATED FIBREBOARD CASES	
1.	THE	GREEK MARKET FOR CORRUGATED FIBREBOARD CASES	33
	1.1	Sources of demand and the size of the market	33
	1.2	Levels and evolution of corrugated fibreboard cases production in Greece	34
	1.3	Prospects for corrugated fibreboard cases demand in the greek market	34
2.	THE	INDUSTRY'S PRODUCTIVE CAPACITY	37
	2.1	Number of enterprises	37
	2.2	Established productive capacity	37

IOBE/SECTORAL RESEARCH AND INTELLIGENCE UNIT

### TEAM 2: PACKAGING MATERIALS

### GLASS CONTAINERS

SECTORAL REPORT 1981

#### 1. THE GLASS CONTAINERS MARKET IN GREECE

#### 1.1 Origin of demand and size of the market

In proportion, glass containers are the largest, from the aspect of production, group of products of the greek hollow glass industry, and cover approximately 85% of total production of such products.

Demand for glass containers originates mainly from the soft drinks, wine, alcoholic beverages and mineral water bottling industries, as well as from some sectors of the processed foods industry.

As it can be seen in Table 1, glass containers consumption in Greece has been steadily increasing since the beginning of the 1970s decade. However, greek per capita consumption of bottled products is still at relatively low levels (26 LT for beer and 41 LT for wine), compared to EEC countries. In 1976, in Greece the per capita consumption of glass containers reached 7 Kgr., as against 18 Kg. in Italy, 34gr. in Germany and 38 gr. in France).

The largest bottlesconsumer in Greece is the <u>soft drinks industry</u>, which accounts for about 33% of total consumption. The steady rise in incomes and the companies' aggressive marketing policy, particularly after the entrance of internationally established foreign brand names in the market (Coca-Cola, Pepsi Cola etc.), are the basic factors for the increase in soft drinks consumption, which exhibits annual rates of increase of about 10-15%. Despite these facts, per capita consumption of soft drinks in Greece remains relatively low and is characterized by strong seasonality during the summer months.

The wine and alcoholic beverages industry is the second largest market for bottles. It absorbs about 30% of total glass containers consumption, as can be seen in Table 2.

However, in the case of alcoholic beverages in particular, a large part of the quantity consumed is imported bottled, and thus a future increase in alcoholic beverages consumption is not expected to immediately affect the greek market for bottles.

.../...

IADLE	1

Consumption of glass containers in Greece, 1970-1979

Year	Consumption (thous.tonnes)
1970	32.8
1971	36
1972	39.6
1973	50.5
1974	54.2
1975	47.9
1976	60.4
1977	72.1
1978	76.5
1979	79.0

SOURCE: SRIU estimates

T	A	ЗL	E	2
_				

thous. tonnes 1970 1974 1975 1976 1977 Wine in bulk (1) 453.0 442.0 491.0 434.0 473.0 Bottled wine (2) 64.0 72.1 91.0 80.2 93.7 (2/1) x 100 21% 14% 15% 18% 19%

Greek production of bottled wine and wine in bulk

SOURCE: SRIU estimates.

The prospects for an increase in demand for bottles for bottling wines are considered rather favorable, because of the continuously expanding consumption of bottled wine, at the expense of wine sold in bulk, for which demand is steadily diminishing.

Per capita <u>beer consumption</u> in Greece, which in 1979 was approximately 26 Lt., is still at very low levels (Germany 145 Lt, England 122 Lt., Italy 17 Lt., France 45 Lt., Denmark 130 Lt.). The <u>beer industry</u> however is also an important bottles consumer. It is estimated that it absorbs about 21% of the domestic bottles production. Certain bottles producing companies, induced by the fast growth rate of the domestic consumption of beer, are planning to expand their production of bottles suitable for beer packaging.

For the time being, the <u>food industry</u> is not showing any significant glass containers absorption rate. On the contrary, it widely uses tinplate cans for the packaging and canning of its products. Of the 300,000 tons of processed food packaged in Greece in 1978 (fruit, vegetables, picles etc.), 246,000 tons (approximately 82%) were packaged in tinplate cans.

The <u>wine industry</u> is the only industry which has not as yet used any other type of packaging material, apart from glass containers (bottles).

The demand for glass containers in the greek market is expected to increase during the 1980s. This forecast is suggested by the expected set up of new units and the expansion of those already established in industries using glass containers as packaging material (breweries, new agricultural products packaging plants etc.).

#### 1.2 Levels and evolution of domestic glass containers production

In 1979, glass containers production constituted 86% of total production of the hollow glass industry (see Table 3). The remaining 14% consisted of various other products for household use.

During the last decade, greek glass containers production presented a significant increase which exceeded by more than 140% its 1970 level. Compared with other packaging materials, glass containers production showed the highest growth. Indicatively, the annual growth rates during the 1974-1979 period for glass containers for industrial and for house-

.../...

4

Product	1974	1975	1976	1977	1978	1979	1980*
Glass containers	51,569	45,912	61,812	70,847	72,500	66,469	29,922*
Household glassware	9,294	10,785	12,944	12,759	13,200	10,966	3,079*
Total production of hollow glass	60,863	56,697	74,756	83,606	85,700	77,435	33,001*

Production of hollow glass products, 1974-1980 (thousand tonnes)

\* January-May.

SOURCE: SRIU estimates.

hold use were 6.7% and 3.3% respectively. The major part of bottles production consists of white and coloured bottles (approximately 7,000-16,000 tons per year), which are mainly used for the bottling of beer and various soft drinks.

Substitution in the greek market of the glass bottle by a plastic one, made of PVC or some other synthetic material, is considered to be rather unlikely in the near future, at least as far as the wine and beer industries are concerned. The majority however of mineral waters is already being packaged in plastic bottles and the soft drinks industry is beginning to take steps in the same direction.

In the beer -and soft drinks- bottling industries, the substitution trend of imetal cans for glass bottles, which at present appears to be somewhat intensified, is, for various reasons, expected first to loose its intensity and then to be gradually reversed.

#### 1.3 Qualitative attributes of greek glass containers

The market for glass containers in Greece is rather small. Domestic consumption concerns a very large variety of containers and effective demand for each type is inevitably reflected in rather small quantities being ordered.

The industry's established capacity, while being in a position to cover increasing demand in the immediate future, faces, for the above reasons, certain difficulties in meeting the market's qualitative requirements.

#### 2. DISTRIBUTION AND MARKETING OF GLASS CONTAINERS IN GREECE

#### 2.1 Tariffs imposed on imported glass containers in Greece

According to the terms for Greece's accession to the EEC, the tariffs in force as of 1.1.81 (and until 31.12.81) for the imports of bottles of a capacity up to 300 grs. is 14.4% for imports from the EEC and 21.6% for imports from third countries.

Regarding imports from the EEC of glass containers of a capacity exceeding 300 grs., the tariff is 17.3% (1.6 drs. per Kg.), and for imports from third countries 24.3%.

A five-year transitional period (1.1.81-31.12.85) is provided for imports of glass containers (as it is the case for most industrial products), for complete harmonization of the above import tariffs to those of the Community (duty-free movement of glassware in the Community and a common tariff of 9.4% on all glassware imports from third countries).

#### 2.2 Greek imports of glass containers

As can be seen in Table 4, between 1975 and 1979, glass containers imports in the greek market increased by 184% in volume, while their value almost doubled.

From the data presented in Table 5 one may observe that in 1977 and 1978, the participation of imported glassware from Eastern European countries to total glassware imports was 23% and 20% respectively (in 1979 their share was reduced to 16% of the total).

In general, glass containers imported from the Eastern European countries are of a rather low quality and are primarily used by provincial soft drinks and alcoholic beverages bottlers. The basic incentive for their import is their relatively low price which, on the average, is lower by approximately 40-50% compared to that of domestically produced bottles.

Glass containers imports from EEC countries, which account for the largest part of glassware imports, tripled during the 1975-1979 period. Their share in total glassware imports reached 76% of the total (volume terms) in 1979, compared to 73% in 1975.

.../...

7

T	A	3L	Ε	4

# Production and imports of glass containers in Greece

	1975	1976	1977	1978	1979	1980
Production (tonnes)	45,912	61,812	70,847	72,500	71,500	72,000
Imports (tonnes)	4,195	5,743	9,043	10,588	11,934	5,428*
Value of imports (thousand drs.)	85,019	102,823	166,400	193,347	248,455	180,488*

\* January - August.

Source: NSSG.

## TABLE 5

# Imports of glass containers in Greece from EEC and Eastern countries

Countries of on	rigin	1977	©esso en sources n × n n d's n o × n	1978		1979		1980*
EEC countries	(ton.)	(thous.drs)	(ton.)	(thous.drs)	(ton.)	(thous.drs)	(ton.)	(thous.drs.)
Germany	3,198	60,620	4,782	76,283	3,323	67,112	2,170	56,400
Italy	1,671	33,805	1,058	23,800	4,013	70,035	944	24,342
U.K.	6	650	24	1,150	1.000	S. Seeting	22	2,540
France	1,265	38,304	1,202	53,390	1,456	66,452	873	60,554
Belgium			206	8,910	233	10,934	· · · ·	a tor
Total EEC	6,140	133,379	7,272	163,533	9,025	214,533	4,009	143,836
Spain	6	500	·			· · · · · · · · · · · · · · · · · · ·	1999 <u>- 1</u> 993	No. 2 - Arresto
U.S.A.	80	4,060	52	2,783	edi <del>-</del> T	a da <del>ga</del> sa sa		l. Monto da
Eastern countries	Y		. (g	a 14 1				
Hungary	665	1,970	107	310	가지 가려 있다. 	si 👾 i s	김 씨 그런 것	10 - <del>1</del> 0 - 1
Bulgaria	1,476	6,310	1,971	8,494	a Shakera	4 <b>-</b>	-5,23	1. 14 MB
Chechoslo- vakia	- 		· · · · · · · · · · · · · · · · · · ·		1,818	13,216	862	9,882
TOTAL	2,141	8,280	2,078	8,804	1,818	13,216	862	9,882
Other countries	676	19,815	1,186	15,258	1,092	20,706	557	26,770
Total imports	9,043	166,034	10,588	190,378	11,935	248,455	5,428	180,488
					and the second	بمعطيتك فيرجب بالك	and the second second	مجانبه بالمحجا إلم

Source: NSSG.

\* January - September.

0

The greatest part of imported glass containers (approximately 33%) originates from Italy, followed by Germany (28%) and France (12%), while small amounts are also imported from other countries, such as U.K., Belgium etc. The prices of imported glassware from these countries increased in 1979 by 61% compared to their 1977 level, thus seriously affecting the cost of greek products packaging.

The factors explaining the realization of glassware imports of types and categories also produced in Greece, vary according to the final user, that is, the bottler. The main arguments advanced, for example, by wine bottling companies concern quality standards of imported bottles vis-a-vis domestically produced ones. Breweries on the other hand, suggest that bottles imports made by them are not so much due to the productive insufficiency of the domestic glass containers industry, but to considerations associated with securing steady supplies.

Available data on glass containers imports do not include imports of glass containers imported transit, by bottling companies which will eventually re export them. It is in fact very difficult to estimate the exact total amount of these glass containers, which mainly concern wine and alcoholic beverages bottles. It seems, however, that frequently the customs-exempted imported glassware ends up in the greek market, without anyone being able to establish its origin or the prices at which it has been imported.

#### 2.3 Greek Glass Containers Exports

Greek glass containers exports between 1975 and 1979 almost doubled. Following however a sudden increase in 1977, a steady decreasing tendency has been observed. This has been the case for the period including the first nine months of 1980, for which data are available.

The decrease in greek glass containers exports is of course directly related to their relatively low international competitiveness. Their comparative disadvantage is however further aggravated by export policies practiced by the Eastern European countries and Italy, for which there have been accusations of dumping prices. Prospects for exports of greek glass containers to the Arab countries are very good, because of the high consumption of soft drinks in these countries. The problem however faced by greek glassware industries is that, because of the large orders placed by the Arab countries, they insist on prices lower than what Greek companies would be able to offer.

The reduction noted in exports is also attributed to the fact that, until 1977, the greek glassware producing companies were in a position to offer marginal cost prices in order to be able to face the competition of other countries. Since then, the gradual increases in raw materials and oil prices seriously undermined companies' flexibility in pricing policies. Greek exports of glass containers are mainly directed to the middle Eastern countries, Egypt, Lebanon, Cyprus (See Table 6).

### TABLE 6

# Exports of Greek glass containers by country of destination (in tonnes)

Destination 1977				1978		1979		1980*	
	(ton.)	(thous.drs)	(ton.)	(thous.drs.)	(ton.)	(thous.drs.)	(ton.)	(thous.drs.)	
CYPRUS	991	15,150	451.2	7,415	85	1,615	1,567.3	23,813	
KUWAIŢ	-	·	10	301	nie stati Australia		651	9,339	
SUDAN	67	1,688	326	5,191			1,099	27,554	
IRAQ	40	911	26.2	428	14	7,332	19	1,023	
S.ARABIA	22	267	34.3	1,012					
LEBANON	-		-	1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 -	36	828	-		
LIBYA	875	14,952	354	5,408	782	15,164			
EGYPT	5,250	34,634	5,538	36,141	2,805	20,690	-		
OTHERS	91	249	49	2,676	629	9,142	9	16	
TOTAL	7,336	67,851	6,788	58,572	4,351	54,771	3,345	61,745	

Source: NSSG.

\* January - September.

#### 3. GREEK GLASS CONTAINERS INDUSTRY'S PRODUCTIVE CAPACITY

#### 3.1 Major Enterprises in the Glass Containers Industry

There are three major companies involved in the production of glass containers (bottles, vials and jars).

Approximately 95% of total production is manufactured by the two largest companies in the industry and the remaining 5% by smaller companies, the largest of which is LARISSAIKI OE. The small manufacturers, which can be best characterized as artisant units, mainly produce vials. They mainly satisfy that part of domestic demand expressed by orders too small and unprofitable to be satisfied by the large companies. The distribution of the greek glass container production per company is presented in Table 7, while Table 8 presents the production of the three major companies for the 1974-1978 period (in thousand tons).

#### 3.2 Regional Distribution of Productive Capacity

The two largest glassware manufacturing plants are located in the Attica area, and the third one in Larissa.

The glass containers industry is by its nature an energy-consuming industry and uses large quantities of raw material. It goes without saying, therefore, that glass containers production plants must be located in close proximity to sources of raw material, in order to be able to obtain supplies at the lowest possible transportation cost.

#### 3.3 Established productive capacity and its utilization rate

The productive capacity of the glass containers plants operating in Greece is at present estimated to be about 125-130,000 tons of produce per year. Estimated productive capacity for the two major producers appears in Table 9.

Total productive capacity of the industry expressed in bottles of all types is estimated to be 380 million pieces per year, 60 million of which are beer bottles. In practice, however, production does not exceed 200 million bottles.

.../...

### Greek production of glass containers by company (1978-80)

_	Average an	nual production	Structure of companier' production		
company	(tonnes)	(million units)	(Bottler)	(Jars others)	
OWENS SA	54,000	135-140	80%	13%	
GIOULA SA	14,000	40-45	80%	13%	
LARISAIKI Co.	2,500	10-12	100%		
TOTAL	71,500	185-197			

SOURCE: SRIU estimates.

### TABLE 8

Production of glass containers by company (tonnes)

manufacture of the second seco			and an				
Company	1974	1975	1976	1977	1978	1979	1980
OWENS S.A	45,000	32,500	44,500	56,000	56.000	54.000	53,000
GIOULA S.A.	3,500	9,500	14,000	12,000	13,500	15,000	16,000
LARISAIKI Co.	3,500	4,000	3,500	3,000	2,500	2,500	3,000
TOTAL	52,000	46,000	62,000	71,000	72,000	71,500	72,000
						and the second sec	

SOURCE: SRIU estimates.

Т	A	В	L	E	9
_					

### Productive capacity of the glass containers companies (in tonnes)

and the second s			
Companies	1978	1979	1980-1981
OWENS S.A.	65,000	75,000	84,000
GIOULA S.A	14,000	20,000	36-40,000

SOURCE: SRIU estimates.

# TABLE 10

# Number of kilns and melting capacity of each company

	Numl	per of kilns		Daily melting capacity	
Companies	for white glass containers	for colour glass containers	under construction		
OWENS S.A.	1	1	1	350 ton.	
GIOULA S.A.	1		1	150 ton.	
LARISAIKI Co.	1 (small)	-	-		
TOTAL	3	3		516 ton.	

SOURCE: SRIU estimates.

The rate of utilization of the plants' productive capacity for the manufacture of glass containers is difficult to be estimated, given the fact that the two major factories in operation also produce other glass products for household use.

The "melting capacity" of the kilns in operation by the two major glass containers companies is approximately 350 tons of molten glass per day for OWENS S.A. and 150 tons for YOULA S.A. The actual output in end-product, however, is around 80% of the above volume and therefore productive capacity amounts to 400 tons of molten glass processed per day (see also Table 10).

It is estimated that the established productive capacity of the industry operates for approximately 300 days per year (continuous operation in three shifts). Overall, however, the degree of utilization reaches approximately 60-65%. More specifically, the plants' productive capacity is estimated to be between 100-105 thousand tons per year in bot-tles and 15-20 thousand tons per year in jars.

#### 3.4 Seasonality in glass containers production

No particular seasonality is observed in the activity of the glass containers industry. Indicative data for the monthly production of glass containers (January 1979-December 1980) are given in the following graph.

Bottles production for soft drinks begins in November and lasts approximately until March, and their delivery to the soft drink factories is carried out between April and September. Soft drinks consumption during the winter months amounts to approximately 20% of summer consumption. During the winter period only cola-type drinks are in demand, but this also amounts to 80% of summer consumption.

For beer, the months of production and the distribution season of the end product coincide. This also applies to the case of soft drinks. Finally, wine bottles production lasts all year round.

.../...

16



MONTHLY PRODUCTION OF GLASS CONTAINERS (JAN. 1979 - DEC. 1980)

17

#### 3.5 New investment in the glass containers industry

Investment undertaken during the last few years, in only very few cases concerned new companies entering the market. On the contrary, established glass containers manufacturers developed a fairly strong investment activity aiming at the improvement and modernization of their plants (improvement and increase of kilns' melting capacity, additions and modernization of mechanical equipment, energy savings through improvement in heating systems and reductions in heat losses of kilns).

The greek glass containers industry is characterized as a "marginal industry", from the point of additional investment interest.

Lack of domestic raw materials and the large amounts of energy required for the achievement of proper kiln temperatures are the basic factors for the determent of new investment.

According to the recent Industrial Development Law 1116/81, the subbranch 332.1, in which glass containers are also included, is placed in the "medium height grant rate", implying a grant rate between 15% and 45 % of the total cost of investment, depending on the location in which the new investment takes place.

From the aspect of size and prospects, the domestic market, at present, is considered restricted, but the increasing demand, especially for jars for the packaging of foods, as well as for beer bottles, because of an increase in production capacity of the greek beer industry, might result in increased production. For the immediate future, however, the two existing companies, are generally considered to be in a position to satisfy the needs of the domestic market. IOBE/SECTORAL RESEARCH AND INTELLIGENCE UNIT

TEAM 2: PACKAGING MATERIALS

METAL CANS

SECTORAL REPORT 1981

#### 1. THE GREEK MARKET FOR METAL PACKAGING CANS.

#### 1.1 Origin of demand and determining factors

Approximately 90% of the tinplate processed by the greek metal cans industry is used for the manufacture of metal containers for the packaging of food, drinks, lubricants, varnishes, paints etc.

The largest part of the tinplate containers production (75-80%) is used for the canning of fruits and vegetables and approximately 8-10% for the packaging of beer and soft drinks.

Demand for packaging containers being a derived demand, is naturally influenced by the evolution of demand for packaged products. The demand for tinplate containers originates from agricultural industries for which the quality as well as the price of the container are quite important factors in the formation of final cost and competitiveness of their products.

1.2 Demand for tinplate cans by the processed fruits and vegetables industies.

Demand for tinplate cans by the processed fruits and vegetables industries is influenced by the existing demand for the packaged end-product and by the state of competition between metal cans and other packaging materials.

The canned fruits, vegetables and juices industries exhibit strong demand for open-top tinplate cans. Approximately 95% of the above industries' products are packaged in tinplate containers.

By the end of 1979, 105 fruits and vegetables canning industries were in operation in Greece. These processed a total of 1,150,000 tons of fresh products. Production of canned peaches is estimated to account for about 60-70% of total canned fruits production.

The rate of increase of domestic demand for canned fruits is estimated to have been stabilized at approximately 2% per annum. Demand for metal cans from this section of the industry should therefore also be regarded as rather stable. On the contrary, demand for citrous juices increases at an average annual rate of 9% and so does demand for tinplate cans used for their packaging.

.../...

Eighty percent of the domestically produced canned fruits is exported. Tinplate containers industry therefore also depends on developments in foreign markets ability to absorb greek agricultural products, as well as on the consumers' preferences in these markets regarding not only types of fruits and vegetables to be consumed but also preferences on alternative types of packaging.

#### 1.3 Demand for tinplate cans by the beer and soft-drinks industries

Approximately 8-10% of total demand for tinplate cans originates from the beer, carbonated drinks and fruit juices canning industries.

Total beer consumption in Greece reached in 1979 approximately 2.5 mil. Hl. It is estimated that 4% of this production was packaged in metal cans. By the end of 1980, sales of beer in cans approached the 53 million-can mark.

For the next few years it is estimated that average growth rate of soft drinks consumption in Greece will fluctuate around 5% per year and that for beer around 6% per year.

It is furthermore expected that the increase in consumption of these products will be accompanied by an increase in the share of total production being packaged in tinplate cans.

1.4 <u>An evaluation of the prospects for development of the domestic</u> demand for tinplate cans.

Future developments in the domestic demand for tinplate cans depend on two main factors:

The development of domestic and foreign demand for canned agricultural products and beverages, and the tendency for substitution between tinplate and glass or other types of containers for the packaging of some of the above products.

A third factor, applying exclusively to the demand originating from the beer and the other carbonated drinks industries, is the prospect of substitution taking place between tinplate and aluminium cans.

.../...

It is expected that canned fruits and vegetables exports will continue increasing in the next few years, at an annual rate of approximately 10%, provided, of course, that the problems which have affected international competitiveness of greek canned products are solved (qualitative handicaps, poorly designed packaging, bad transportation, inefficient distribution).

Another factor which may influence future developments of exports of greek products to EEC countries, is the observed tendency to substitute canned fruits and vegetables for fresh. This substitution is already quite obvious even in countries such as Italy and France, major producers of fresh fruits and vegetables.

Future developments in the beer and soft drinks market for cans will crucially depend on the domestic market situation since external demand is minimal. As already indicated, demand for these products for the next few years is expected to increase at annual rates of approximately 5-8%.

#### 1.5 Tinplate cans domestic production

The amount of tinplate being processed in Greece amounts to an average of 120,000 tons per year and it is estimated that approximately 90% of it is absorbed by the cans industry. As of 1980, the distribution of processed raw material, according to the products produced, estimated to be the following:

OPEN TOP CONTAINERS (for fruits and vegetables packaging)	60,000	tons	or 50%	
GENERAL LINE CONTAINERS	40,000	tons	or 33%	
SOFT DRINK AND BEER CANS	7,000	tons	or 6%	
TINPLATE CLOSURES	4,000	tons	or 3%	
OTHER TINPLATE PRODUCTS	9,000	tons	or 9%	

The average annual increase of domestic tinplate consumption between 1970-1978 was approximately 12%. This rate however does not necessarily reflect the total actual increase in cans production, given the

fact that during the period not only the composition of total cans production according to cans size (and consequently average-per can- tinplate consumption) might have changed, but furthemore the cans produced are gradually becoming lighter (with no effect on their quality). The average estimated domestic tinplate consumption can be seen in Table 1.

The production of open top containers for the packaging of soft drinks and beer in Greece is a fairly recent activity which essentially began in 1977.

Total production of open top containers for canned fruits, vegetables etc. is equally distributed among the three major cans producers, each having an annual production varying between 23-30,000 tons.

Total domestic demand for open top containers is distributed over seven (7) basic containers sizes, together accounting for the largest part (about 98%) of total sales. These basic types of containers are:

1.	1/10 (100gr.)	: small size, mainly for tomato paste packaging (appro-
		ximately 24% of total open top containers sales).
2.	150 gr.	: also for tomato paste packaging (8% of total sales).
3.	6 oz (172gr.)	: primarily for fruit juices (6% of sales).
4.	9 oz (258gr.)	: also for juices (12%).
5.	<sup>1</sup> <sub>2</sub> Kg.	: for tomato paste and canned fruits (14%).
6.	1 Kg.	:(contents 825-850 gr.) primarily for canned fruits
		(19% of total sales).
7.	5 Kg.	: mainly for exported tomato paste (15% of sales).

While total open top containers production increased steadily until 1977, in the past two years (1978-1979) it began to exhibit declining tendencies (see Table 2). Imports of empty containers for the packaging of certain goods have been made, although in small amounts. The constantly increasing tendency for substitution of cans by glass jars for certain processed vegetables packaging has also to some extent contributed to the decline in tinplate cans production.

Tinplate containers, also include "general line" containers. The production of "general line" containers is on the decline, primarily because of them being substituted by plastic containers used for the packaging of lubricating oils. The annual rate of decline in general line tinplate containers production is estimated at about 5%.

Year	Tinplate consumption in thous. tonnes	Production of Open-Top tin- plate containers in thous.Units
1971	60.4	189.1
1972	66.6	351.4
1973	63.9	442
1974	110.3	634.9
1975	88.6	548.1
1976	79.2	843.7
1977	121.6	973.7
1978		843.9
1979		824

Domestic tinplate consumption and production of open-top tinplate containers

Source: SRIU estimates.

# TABLE 1

T/	AB	L	E	2
1.1		-	55.	

OPEN-TOP		ГОР	General	Line
Year	Million Units	% change	Million Units	% change
1971	189.1			
1972	351.4	85.8		
1973	442.0	25.8	97.3	$\{ i,j\} \in \mathcal{I}$
1974	643.9	43.6	80.1	- 17.7
1975	548.1	- 13.7	98.1	22.5
1976	843.7	54.0	82.0	- 16.4
1977	973.7	15.4	72.2	- 12.0
1978	843.9	- 13.4	70.6	- 2.2
1979	824.0	- 2.4		

Domestic production of tinplate cans

Source: SRIU estimates.

#### 2. PRODUCTIVE CAPACITY OF THE GREEK TINPLATE CANS INDUSTRY

#### 2.1 Number of companies

There are three major companies involved in the manufacturing of open top containers of all types. Furthermore, certain canning industries, such as KYKNOS and OMOSPONDIA, (the second one a cooperative), should also be included in the cans producers' group, since they have their own containers production lines, mainly for their own consumption but also for restricted sales to other canning factories.

The distribution of total tinplate cans production among the three major productive companies differs depending on the type of container. However, in the open top containers category, production is almost equally distributed among the three largest companies.

The range of products manufactured by the companies completely cover the scope of needs of the greek canned foods and soft drinks industries. The products manufactured by these companies are the following:

NATIONAL CAN S.A.

Open top cans Easy open cans Fish products containers (sardine cans) General line containers

#### HELLAS CAN S.A.

Open top cans Easy open cans Aerosols Easy open ends ELSA S.A.

Open top cans Easy open cans Grown closures General line containers

The above companies account for approximately 90% of open top containers production for foods, beer and soft drinks and have 8 production plants, 5 of which operate throughout the year and the rest operate seasonally.

Annual production of cans of all types, for each of the three companies, is estimated to be around 200-320 million pieces and is presented in Table 3.

A characteristic of the sector is the close links between domestic producers and foreign companies. METAL BOX of England participates in Hellas Can, NATIONAL CAN USA participates in NATIONAL CAN, while ELSA, a purely greek company has technological cooperation with AMERICAN CAN.

1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -		(in m	illion units	;)
FIRM	TYPE OF CONTAINER	1978	1979	1980
	OT Beverage cans (soft drinks)	33	32	53
NATIONAL CAN	OT Beverage cans (beer)	16	32	53
	OT Food cans		220	-
	OT Beverage cans (soft drinks)	-		18
HELLAS CAN	OT Beverage cans (beer)	111 - 11 - 1	1. 1. j. n. j.	
	OT Food cans	252	200	260
ELSA	OT Food cans	320	200	300
OTHER FIRMS	OT Food cans		100	110

## TABLE 3

ESTIMATED PRODUCTION OF OPEN TOP CANS OF THE THREE LARGEST FIRMS

SOURCE: SRIU.

#### 2.2 Regional distribution of producing units

The location of a production plant for open top containers for the packaging of fruits and vegetables is closely related to the regional distribution of fruits and vegetables production which is to be processed. On the contrary, production of open top containers for beer and soft drinks is more market-oriented.

Plants located in the Attica area manufacture open top containers for canned apricots, as well as containers for tomato paste, beer, soft drinks and aerosols, destined to supply the large Athens market. The cans producing plants located in Northern Greece exclusively serve the peaches and tomato paste production of that area.

#### 2.3 Established productive capacity and rate of utilization

The established productive capacity for at least the three major companies, is estimated as follows:

NATIONA	AL C	AN:	1,200,000	cans	per	8-hour	shift	(150,000 cans	per	hour)	)
HELLAS	CAN	:	800,000	cans	U	н	н	(100-110,000	0	")	)
ELSA		:	900,000	cans	н	u –	0	(100-110,000	н.	")	)

The productive capacity for each production line of soft drinks and beer cans is estimated to reach approximately 90 million cans per year or 350 thousand cans per day in three shifts, for 225 days per year.

No more than two shifts a day are required for the manufacture of open top containers for canned fruits and vegetables. The production capacity of the production lines of such containers, which are characterized by sufficient uniformity in types and dimensions, depends on the type and size of the can (the larger the dimensions of the can, the lower the production capacity in pieces per hour).

Domestic demand for containers is distributed over many types of containers, each in relatively small quantities. Greek Companies are therefore obliged to manufacture a range of products, definitely wider than what would allow them to reap economies of scale associated with uniformity in production. The rate of utilization of productive capacity is directly related to the seasonality of demand for the companies' products. The production and demand for open top containers is characterized by strong seasonality. This type of cans is mainly used for fruits and vegetables of the summer period while during the winter months demand comes exclusively from citrus and other fruit juices and fruit pulp canning industries.

The seasonality and the instability in fruits and vegetables production create quite a few problems for the tinplate containers manufacturers. Furthermore, production is largely based on orders which maybe cancelled at any time, thus creating serious risks for any producers attempting to extent its production to cover seasonal peaks.

#### 2.4 New investments in the greek tinplate containers industry

The tinplate containers manufacturers already operating in the greek market are capable of covering a very large part of the anticipated future demand for metal containers.

The existing companies have recently made certain extensions to their facilities and do not seem keen in undertaking further new investment, except for mechanical equipment replacements.

No significant change is expected in the number of production lines manufacturing open top containers for canned foods, due to the nonsignificant increase in canned fruits and vegetables production anticipated. On the contrary, productive activity for beer and soft drinks containers increases constantly and new lines of the latest technology are being added.

Future investment initiatives by containers manufacturers will be a function of future investment plans for increased production of the beer/soft drinks industries rather than that of the food canning industries.

#### 2.5 Prospects for the Two-Piece Aluminum Cans in Greece

The existence of a relatively large market capable of absorbing a minimum volume of production of such containers is a basic condition for undertaking such an investment.

28

It is estimated that in 1980 the market for all types of metal containers in Greece was approximately 120 million containers. If we assume that in the next few years the market will expand at an annual rate of approximately 10%, in 1983 it will have reached approximately 180 million containers, which could possibly allow the operation of just one plant manufacturing two piece aluminium cans. However, even if all existing beer and soft drinks industries begin packaging their products in aluminum containers, it is very difficult to forecast the reaction of the tinplate containers manufacturers, which would compete against aluminium cans either by applying improved technology (SUDRONIC welding etc.) or even by importing themselves two-piece aluminium containers from abroad. This is in fact quite likely since both METAL BOX and NATIONAL CAN operate two-piece aluminium cans plants in other European countries (Italy and others).

The production cost of an aluminium container which could be manufactured in Greece in the future has been estimated at about 4-4.50 drs. The capital cost for such an investment, however, is considered to be very high since, the total investment could go over 1 billion drs, while the net profit rate of the metal containers industry is already considered rather low. Two investment efforts are currently being made for establishing production plants for two-piece aluminium cans. One by BREWERIES OF GREECE S.A. manufacturing LOWENBRAU beer and the other by ALUMINIUM OF GREECE S.A. (itself a subsidiary of PECHINEY UGINE KUHLMAN Co.).

29

#### 3. RAW MATERIALS FOR THE PRODUCTION OF TINPLATE CONTAINERS

#### 3.1 Types of Raw Material and Terms of Supply

Raw materials include tinplate, which participates by 60% in the formation of total production cost and other auxiliary materials which participate by an additional 10%. Chrome-plated iron, a substitute of tinplate, participates in raw materials at a constantly increasing rate. A small amount of aluminium is also used for the manufacture of easy open containers tops.

Approximately 80-85% of the tinplate used by domestic cans manufacturers is imported, while the remaining 15-20% is produced domestically. Eighty percent of the tinplate imported comes from the EEC countries, while small quantities are also imported from the Eastern European countries. Most metal containers manufacturers import tinplate in sheets, ready for processing.

The greek market's total requirements in tinplate are estimated at about 110-120 million tons per year, 80 million tons of which are imported and the rest are supplied by HELLENIC STEEL.

The productive capacity of Hellenic Steel reaches 60,000 tons per year, while its production for the 1978-1980 period was between 40-50 thousand tons of tinplate.

Supply of tinplate to manufacturers is conducted on contract and at a prices depending on quantity and quality of the tinplate ordered. The frequency and the volume of previous orders are also taken into account for the determination of conditions of supply. Another factor relevant for price fixing is the foreign supplier's general policy concerning prices to be fixed for the Greek market.

Cans manufacturers affiliated in one way or another with foreign companies exhibit a tendency to purchase raw materials from the same sources as their foreign affiliates.

#### 3.2 Factors Determining Tinplate Prices

Tinplate prices in the international market appear to be relatively stable, in comparison with the prices of other raw materials, whose fluctuations are rather wide.

Companies ordering tinplate for manufacturing of open top containers always buy top quality tinplate, while tinplate of a lower quality is used for manufacturing of general-line containers.

On average, the prices of blank (non-lithographed) tinplate sheets for Greece during the 1974-1979 period generally increased but their increase rate was definitely lower than that observed for competing materials, such as aluminium. (See Table 4).

Available 1979 data concerning prices of Hellenic Steel tinplate used for manufacturing of containers to be exported suggest that prices were around US \$ 720-750 per ton, almost at the same level as those of imported tinplate. Prices for tinplate to be used for domestically consumed cans were higher by about 15%.

In the beginning of 1981 the respective average tinplate prices were approximately US \$ 1,080 per ton.

#### 3.3 Tariffs imposed on Tinplate imported to Greece

According to the terms of the Treaty of Accession to the ECSC, import tariffs applicable as of 1.1.81 (and until 31.12.81) are: 10.8% for imports from the EEC, and 12% for imports from "third countries".

For tinplate, a five-year transition period has been agreed upon for complete abolition of tariffs on imports from ECSC-member countries.

Total surcharge on imported tinplate, including basic duty, reaches or exceeds 30%, if stamp duties and various other expenses are taken into account.

Eighty percent of imported tinplate is eventually exported as cans and it is therefore imported under temporary customs exemption. The benefit therefore which will result from the gradual tariff reduction concerns tinplate which will be used for the manufacture of tinplate containers to be distributed and consumed by the domestic market.

TAB	LE	4

AVERAGE PRICES OF BLANK TINPLATE SHEETS IMPORTED IN GREECE

Year	(USdollars per ton-ex factory)
1974	532
1975	648
1976	563
1977	606
1978	636
1979	720*

\* The price of USD 720 per ton ex factory increases to approximately USD 800.- CIF Piraeus. In 1980, the price for lithographed and varnished sheets for the manufacture of tomato paste containers was USD 1,050 per ton CIF Piraeus.

SOURCE: SRIU estimates.

SECTORAL REPORT 1981

# IOBE/SECTORAL RESEARCH AND INTELLIGENCE UNIT

### TEAM 2: PACKAGING MATERIALS

### CORRUGATED FIBREBOARD CASES

#### 1. THE GREEK MARKET FOR CORRUGATED FIBREBOARD CASES

#### 1.1 Sources of demand and the size of the market

Corrugated fibreboard cases are used primarily for packaging and shipping by the food and drinks industry, but also by many other durable or consumer products, ranging from detergents and paper products to clothing and electrical appliances.

Demand therefore for corrugated fibreboard cases originates from a wide range of customers from various industries. It is estimated, for example, that, as far as Greece is concerned, the canning industry absorbs approximately 10-15% of total production, packaged foods (pasta, baby foods etc.) about 15%, fresh fruits and raisins (currants) another 15%, threads and yarns about 10% and detergents approximately 8%. The remaining 40% is distributed to customers from other industries. Given this wide range of sources of demand, corrugated fibreboard cases manufacturers do not rely extensively on only certain large customers. They are therefore able to avoid problems which could possibly be creaby ted the seasonality or other more permanent problems affecting certain branches' activity.

Corrugated fibreboard cases have acquired a particular significance for Greece since they have come to be closely associated with the transportation of fresh fruits and vegetables abroad.

Per capita consumption of corrugated fibreboard cases in Greece is estimated to be approximately 10Kg. It is definitely considered as rather low, and much lower than the average per capita consumption in the EEC countries, which in 1978 it was approximately 25Kg.

In the greek market the tendency to substitute corrugated fibreboard cases by other packaging materials, such as the by-products of thermoplastics (shrink wrap, polystyrene etc.), which has appeared in other countries, is still at its initial phase. On the other hand, the corrugated fibreboard case in Greece is itself considered to be a substitute for other more traditional products, such as the wooden crate, from which the fibreboard case is still winning ground. The flexible pla stic packaging sheet (shrink wrap) is recently being used in Greece as a substitute for part of the fibreboard case (the lower part of the box remains), primarily for the packaging of beer and soft drinks in cans.

# 1.2 Levels and evolution of corrugated fibreboard cases production in Greece

Official statistical data do not exist for the greek corrugated fibreboard cases production. However, almost all of the production of special fibreboards, except for a minimal quantity exported, is used for the manufacture of corrugated fibreboard cases or of other types of fibrebroad packaging.

During the 1975-1979 period, the production of all types of fibreboard (white, brown and corrugated) showed an increase of approximately 47% (See Table 1). It is estimated, however, that total fibreboard production in 1979 amounted to approximately 80,000 tons, and that in 1978 75,000 tons of fibreboard cases for use in the domestic distribution of goods must have been manufactured. It is furthermore estimated that, with an average fibreboard case weight of around 400 gr., 175-185 million pieces were produced during these two years.

The fibreboard cases production for 1980 is estimated to have reached approximately 83 thousand tons (193 million pieces).

The four largest fibreboard cases manufacturers (mentioned in section 2.1 below) which were in operation in the beginning of 1980 accounted for approximately 85-90% of total production.

### 1.3 <u>Prospects for corrugated fibreboard casesdemand in the greek</u> market

Future prospects for corrugated fibreboard cases demand in Greece will depend on developments in the production, exports and activity in general of their user industries.

The food branch, which absorbs 40-45% of total corrugated fibreboard cases production, will continue to play an important role in the formation of total demand. Among its various individual segments packaging of fresh fruits and vegetables will continue to constitute a

### TABLE 1

#### (tonnes) Corrugated Fibreboard White Fibreboard Brown Fibreboard Year 1975 15,769 14,746 49,857 1976 17,367 13,315 62,601 1977 16,956 19,059 63,496 1978 21,137 21,650 65,712 1979\* 25,286 71,629 21,199

### Greek Production of Fibreboard

\* Provisional data.

SOURCE: NSSG.

most dynamic market. The wooden crate, considered as the conventional packaging material for the transportation and distribution of fresh fruits and vegetables in the domestic and foreign markets, is gradually loosing ground in favor of corrugated fibreboard cases and other packaging materials, such as expanded polysterene crates etc.

Developments in the structure and the character of retail sales will also be factors which will influence fibreboard cases demand. The entire retail sales network is expected to further emphasize the importance attached to types of packaging suitable for relatively heavy transportation and therefore corrugated fibreboard cases design and technology must be adjusted probably with the addition of new materials increasing its strength.

#### 2. THE INDUSTRY'S PRODUCTIVE CAPACITY

#### 2.1 Number of enterprises.

There are nine (9) relatively large corrugated fibreboard cases manufacturing companies. The four largest account for approximately 85% of the total annual production of the branch. The production of each of the remaining companies is estimated to be the order of 3,000 tons per year. There are also small fibreboard cases manufacturers, with a production of less than 2,000 tons per year each. Production per company for the 4 largest companies is presented in Table 2.

Among the companies indicated in the Table, VIS S.A. and PACO S.A. are vertically integrated. They produce paper pulp from hay and scrap paper and they proceed with paper production of about 12,000 tons each (average for 1979-1980) and continue with the production of corrugated fibreboard cases and fibreboard cases.

The remaining companies, that is, ST. REGIS S.A., CARTONPACK S.A., VARMIS, VARHART etc. purchase paper in rolls, convert it to corrugated fibreboard and from this they produce fibreboard cases. Finally, other small handicraft untis purchase ready corrugated fibreboard in rolls and convert it to fibreboard cases.

#### 2. Established productive capacity

Table 3 below presents the established productive capacity for the five largest companies, as it was estimated for 1980.

Total productive capacity amounts to approximately 120,000 tons per year.

The rate of productive capacity utilization is estimated to approximately 75% of established capacity and does not present any particular seasonality.

TAE	SLE	2
		_

Firms	1977	1978	1979	1980	1
1. VIS	26.650	27.100	28.500	30.000	
2. ST. REGIS	14.000			15.000	
3. CARTONPACK	16.000	( <b>-</b> 196	문화성	17.000	
4. PACO	10.000	13.000	14.000	15.000	

Production of corrugated fibreboard cases by the major firms

: No data available.

SOURCE: SRIU estimates.

## TABLE 3

Greek Corrugated fibreboard cases industry. Estimated established productive capacity by company (5-largest companies, 1980)

Companies	Tons
VIS S.A.	40,000
CARTONPACK S.A.	20,000
PACO S.A.	22,000
ST. REGIS S.A.	20,000
TECHNOPACK S.A.	8,000

SOURCE: SRIU estimates.