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A REPORT BY *LC Canada*  
THE SECTOR TASK FORCE ON

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THE CANADIAN PLASTICS PROCESSING INDUSTRY

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Chairman A. G. Moreton

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REPORT OF  
THE CONSULTATIVE TASK FORCE  
ON  
PLASTICS PROCESSING

JUNE 1978

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ON PLASTICS PROCESSING

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INTRODUCTION

The Consultative Task Force on Plastics Processing\* is one of 23 task forces established as a result of the First Ministers' Conference in February of this year. The First Ministers agreed through the task forces to "seek the active involvement of the private sector, business and labor, in federal/provincial discussions on specific development programs tailored to the particular requirements of each manufacturing sector."

The report of the Consultative Task Force on Plastics Processing covers an industry sector in Canada composed of more than 1,400 manufacturing establishments involved in the manufacture of plastic products for a market that exceeded \$2.9 billion in 1977 (approximately one-quarter is supplied by imports). About 60 per cent of these establishments have sales of less than \$1 million per year, while 20 per cent produce greater than 70 per cent of the value of the total industry shipments. Approximately 80 per cent of the plastics processing establishments are Canadian-owned.

The industry's output finds its way into a multiplicity of markets with 70 per cent going to packaging, building and construction, home and commercial furnishings, and automotive markets. At its peak level of employment in 1974, the industry employed approximately 45,000 people and employment had been growing at six per cent per year. The volume of output grew 13 per cent per year in the decade prior to 1975.

For the past three years, however, there has been little growth in the plastics processing industry. The quantity of shipments dropped by nine per cent in 1975 and increased about nine per cent and eight per cent in 1976 and 1977 respectively, so that the average annual growth through the period 1975 to 1977 was in the order of only three per cent. Employment has increased moderately during this period, and at the end of 1977 was about four per cent above 1974.

The plastics industry is a vital link in the chain of industry that begins with oil and gas, proceeds through petrochemicals to plastics processing, ending with a myriad of products needed by the Canadian consumer. Appendix I illustrates this relationship.

OBJECTIVE

The objective of the Task Force has been to formulate RECOMMENDATIONS THAT WOULD CONTRIBUTE TO THE DEVELOPMENT OF A RESPONSIBLE, PROSPEROUS, INTERNATIONALLY COMPETITIVE PLASTICS PROCESSING INDUSTRY IN CANADA.

In formulating the recommendations contained in this report, the Task Force recognized that the benefits which would result from their implementation would only be achieved if the recommendations are accepted and if industry plays its part in active development of the sector. In this respect, the Task Force strongly urges the industry to improve its manpower resources to ensure that opportunities can be examined and seized and that the industry adopts a responsive attitude to the opportunities which would occur from the improved environment.

The Task Force proposals are aimed at two broad areas. The first is to provide incentive to the industry to get the job done, and the second is aimed at creating a Canadian environment in which our businesses will have an opportunity to compete equally against foreign competition.

The recommendations to governments deal primarily with issues impacting directly on the plastics processing industry and not on those issues of broad concern to Canadians and industry generally. In this respect there is little said about the importance of control of

\* See Appendix III

government expenditures to halt their increase as a per cent of GNP or on the establishment of monetary policies well designed to aid in reaching objectives. Omission of specific comment in such areas should not be taken as an indication that they lack importance to the sector.

While the report focuses strongly on recommended actions by government, the role of industry and labor is noted where they must effect necessary changes.

#### MAJOR ISSUES AND RECOMMENDATIONS

In considering the major issues impacting on the sector, the Task Force used as a data base the attached sector profile, prepared by the Department of Industry, Trade and Commerce, entitled "The Plastics Processing Industry in Canada". In addition, the Task Force took account of the background provided in various papers on Canada's current economic situation and medium-term prospects including the Department of Finance 1978 document entitled "Canada's Economy - Medium-Term Projections and Targets" and papers submitted to Government by the Society of the Plastics Industry of Canada. (See Appendix II)

In developing its recommendations, the Task Force has attempted to be as specific as possible. Nevertheless, the Task Force had to be less specific than desirable in some of its recommendations. The three-month period available within which to conduct its work was not sufficient for the development of the necessary background required to be more specific. As a result, and because it views the consultative approach as desirable and one worth continuing, the Task Force suggests that this process should be ongoing, as long as the meetings are considered worthwhile.

The following are the major issues identified by the Task Force as impacting on the sector and the recommendations the Task Force proposes to deal with each issue.

##### A. Cost Competitiveness

The single most important issue confronting the plastics processing industry in Canada is its competitiveness in comparison with other countries, especially the United States.

In 1975, a comparison of the economics of processing plastics in the United States and Canada was carried out by a Canadian consulting firm with the assistance of a U.S. consulting firm. The sample survey indicated that the Canadian processors were at about an 18 per cent cost disparity with their U.S. counterparts. The major elements of this disadvantage were structural inefficiencies resulting from shorter run lengths and higher raw material and capital costs. At the time of the study, manpower cost differences were mixed and relatively small, and the exchange rate was close to par.

By 1977, however, average manpower cost differences had increased substantially. A survey conducted by the industry indicated that the average Canadian wage rate was 15 per cent higher than in the United States by the end of 1977. The effect of this would be to increase the 1975 cost disparity by about three per cent, however lower raw material costs over the same period have nearly offset this higher labor cost. Since 1975, the Canadian dollar has devalued by more than 10 per cent against the U.S. dollar, a result which is partly attributable to our poor wage performance relative to the United States. This change in the Canadian dollar has assisted significantly in improving short-term competitiveness.

The following is an assessment of the various elements which impact on the ability of the plastics processing industry in Canada to be competitive with the industry in the United States. Also listed are specific recommendations designed to improve competitiveness.

## 1. Structural Disadvantages

The 1975 study identified a seven per cent cost differential between the companies surveyed in the two countries due to greater structural disadvantages affecting the Canadian companies. These result from such factors as climate, geography, market size, and fragmentation of the industry. Of these, climate probably has the least adverse impact and actually offers some unique opportunities. On the other hand, Canada's geography makes efficiency difficult to achieve because it results in a small total market being thinly spread over a great distance. This necessitates putting more plants into production than would occur if the market was more concentrated. Freight considerations dictate local manufacture for many plastic products.

The two major sources of inefficiency are the size of the total market and the fragmentation of the industry. The small total market causes the industry to make a number of products on the same machine with relatively short run lengths resulting in higher tooling costs, lost machine time, higher maintenance, higher scrap rates, and lower production rates due to less operating experience in making a particular product. In the United States, a machine can be used in many cases to make only one product. When there are too many companies serving the market, these problems are exacerbated. As well, the industry tends to operate at lower levels of capacity utilization.

Certain segments of the plastics processing industry may be in a position to improve their productivity through mergers, acquisitions, or specialization agreements.

There may be scope for some improvement in the productivity of the plastics processing industry in Canada compared with the United States, however the relative size of the two markets does limit the gains that can be achieved. Nevertheless, the Task Force was of the view that a 20 per cent reduction in the current productivity disadvantage of seven per cent might be a reasonable goal for both industry and governments to pursue. This would reduce the overall competitive disadvantage for the companies surveyed by about 1.5 per cent.

Specifically:

- (i) The Federal Department of Industry, Trade and Commerce under its existing Enterprise Development Program should provide financial assistance for studies leading to consolidations and should also provide financial assistance to companies involved in the implementation of the results of the studies.
- (ii) To reduce fragmentation in the industry and improve capacity utilization, DREE and individual provincial governments should provide financial support for new plastics processing facilities only after careful assessment of the implication such capacity will have on existing operations both within a province and within Canada, and if the marketplace requires new capacity.
- (iii) Legislation in Canada should not be overly burdensome in pursuit of consumer protection so as to be a significant impediment to the pursuit of needed industry rationalization. Care should be taken with respect to competition legislation and subsequent regulations to ensure that Canadian industry and eventually the consumer do not suffer through impediments to the development of an efficient industry. In this respect recommendations from industry sectors and the Canadian Manufacturers' Association should be very carefully considered. Current laws already provide a formidable barrier to industry rationalization activity, despite the assistance of the federal government.

## 2. Input Costs

A major factor in Canada is the comparative cost of raw materials, manpower and capital. It is of critical importance that these costs be no higher than those in the United States and preferably less to help alleviate higher costs that will be with the industry for many years due to the structural problems previously discussed.

While the current value of the dollar is of considerable assistance in achieving competitiveness, the Task Force was of the view that parity between the Canadian and the U.S. dollar should be used as a basis for developing the industry over the long term and is the basis under which the following recommendations are developed.

(a) Raw Materials

The 1975 study identified a six to seven per cent cost differential due to raw material costs for the companies surveyed in the two countries due to differences in price and in scrap rates. Differences in raw material prices accounted for about five per cent. This constituted one of the largest contributions to the total cost disadvantage of the Canadian firms.

Prices of resins manufactured in Canada have nearly always exceeded world prices. On completion of large-scale petrochemical expansions in Alberta, Ontario and Quebec, it is anticipated that Canada will be in a position to have a reliable source of domestic supply of the five largest volume plastic resins (low density polyethylene, high density polyethylene, polyvinyl chloride, polystyrene and polypropylene) at prices close to being competitive with U.S. prices. If the Canadian plastics firms surveyed had access to resins in Canada at prices competitive with those in the United States, at the time of the study in 1975, the competitive disadvantage would have been reduced by about five per cent. It is of critical importance to the plastics processing sector to have access to plastic resins at prices competitive with U.S. prices. The continuing development of an internationally competitive petrochemical industry in Canada is important to the plastics processor.

(b) Labor and Manpower

The Task Force is greatly concerned about the increasing, adverse wage differential between plastics processing workers in Canada and those in the United States. To be competitive, it is important that governments, industry and labor pursue policies aimed at achieving parity between labor and manpower costs in the two countries.

The Task Force recognizes the various interests to be considered in achieving manpower costs no higher than in the United States. In this area, there are matters of common concern that may assist in bringing total wage/salary and fringe benefits more in line with the United States. All stand to gain from the boost in the economy that would result from improved competitiveness and the subsequent improvement in job security and lowering of unemployment rates. The bargaining process with its high degree of confrontation may make the process a slow one. The large number of small firms that comprise the industry may make it difficult to negotiate meaningfully with a large union.

In addition, the Task Force is concerned about what it perceives to be the negative effect of the present Unemployment Insurance Plan administration on the work ethic. This, in combination with the industry facing a potential problem of an inadequate supply of suitable manpower, resulted in a recommendation by the Task Force that a portion of the unemployment insurance funds be dedicated to supporting the hiring of unemployed people by companies for purposes of on-the-job training.

The Task Force noted that there is a difference between the work schedules of plastics processing plants in the United States and Canada. In the United States, seven-day, 21-shift weekly schedules appear to be common, whereas Canadian companies encounter severe resistance to more than a five-day, 15-shift weekly schedule. This disadvantage has a strong adverse impact on the productivity performance of the Canadian industry in comparison with that of the U.S. industry. Although it is recognized that it would be difficult to reverse this work practice

in Canada, it suggests that management, labor and governments should work closely together to reduce the differences that currently exist.

A paradox that merits further analysis and discussion between management, labor and governments is that, despite stated needs by industry for trained people, courses established by educational institutions to train such people have failed for lack of sufficient people attending such courses to make the instruction economically feasible. Apparently the demand for graduates was not present for reasons unknown.

Both labor and management representatives on the Task Force acknowledged the importance of maintaining an international competitiveness in the Canadian plastics processing industry, and expressed their willingness to examine long-term improvement objectives. One forum proposed for such discussions was the Task Force.

Specifically:

- (i) Governments, management, and labor should pursue policies aimed at achieving parity of labor and manpower costs in Canada and the United States.
- (ii) To assist in achieving this goal, wage settlements in the public sector, and particularly essential service groups, should not lead, but should follow settlements in the private sector and be based on an index of recent private sector wage settlements.
- (iii) Governments should actively publicize wage settlements achieved in the public sector which meet current targets.
- (iv) Governments should ensure that the levels of minimum wages in Canada are consistent with representative levels in the United States.
- (v) Unemployment benefits in Canada should not be more generous than those provided in the United States, and should not be a significant disincentive to seeking employment.
- (vi) The Federal Government should consider redirecting unemployment insurance funds towards assisting companies to hire unemployed people in order to train them as tradesmen.
- (vii) Management, labor, and governments should continue to meet jointly, as long as such meetings are deemed worthwhile, in order to analyze and consider solutions to the apparent disparity with the U.S. in plant working schedules, and the problems anticipated by the industry in obtaining an adequate supply of suitable manpower.

(c) Capital Related Costs

The plastics processing industry is generally not capital intensive and capital costs are the least important element influencing total costs. Nevertheless, the comparative economics study of U.S. and Canadian plastics processing companies indicated that capital charges for the firms studied were higher in Canada and that this increased the total cost disparity about three percentage points. Although the Task Force is of the view that, at best, only a marginal improvement could be made in this cost disparity, it is supportive of recommendations designed to eliminate this disadvantage in Canada relative to the United States.

Specifically:

- (i) Maintain the current accelerated depreciation provisions for processing industries.
- (ii) Increase the investment tax credit to 15 per cent without impairment of the capital base for depreciation purposes.

### 3. Tariffs and Trade

The Task Force recognizes that Canada has constraints in its application of tariffs and trade mechanisms under the GATT and that room for negotiation in the present round of GATT negotiations is also limited. Nevertheless, the Task Force must emphasize that actions in these areas are very important to alleviate cost disadvantages remaining until and after recommendations dealing with structural problems and input costs are implemented. It is the Task Force's view that recommendations in this area are critically important to the preservation and growth of the sector.

Exclusive of the value of the Canadian dollar, we believe today that Canadian plastics processors are at about an 18 per cent cost disadvantage with firms producing similar products in the United States. The major elements of cost disparity discussed were structural inefficiencies, manpower costs, and raw material costs.

The Task Force is of the opinion that about 1.5 per cent of the structural disadvantage may be possible to remove. As well, it is anticipated that raw material prices will continue to be closer to U.S. prices than in 1975. This should result in raw material cost differences contributing no more than about 2.5 per cent to the cost disparity. Should labor rates achieve U.S. levels, then a further four per cent gain would be achieved. Assuming that this occurs and the dollar is at parity with the U.S., the industry would continue to be at a disadvantage of about 12 to 15 per cent with the United States.

During this period, and in tune with events as they unfold, there is a large role for trade-related policies to assist industry development. In particular, it would be very damaging should this sector of Canadian industry be subject to the full tariff cuts at the current GATT negotiations that would result from rigid adherence to the Swiss Formula. The industry, depending on the value of the dollar, may be able to withstand a tariff cut of 25 per cent if all events unfold favourably. On the other hand, if manpower costs remained five per cent higher and tariffs were reduced 25 per cent, then to offset this higher cost, a reduction in corporate taxes in the order of five percentage points would be required.

Specifically:

- (i) The Federal Government should place plastic products on the list of products exempt from full formula cuts at the current GATT negotiation, and should pursue retention of the existing tariff. If this cannot be achieved, a moderate cut in the existing Canadian tariff is the maximum to which Canada should agree.
- (ii) Further investigation should be undertaken to define reports by industry of "harassment" at the border when exporting to the U.S. The investigation should be followed up appropriately to help eliminate such problems.
- (iii) The burden of proving injury during hearings of the Anti-Dumping Tribunal is very heavy for most Canadian companies and should be reduced. Swifter and more aggressive use of such measures as anti-dumping and countervail would improve their effectiveness and reduce the need for their application.



#### 4. Taxation

Tax-related measures are of importance not only to set a competitive tax environment but also to assist with the primary requirements of incentive and providing an environment of equal business opportunity. Tax mechanisms can assist in competitiveness when measures relating to structure, cost of inputs, and trade are not sufficient to solve all of the problems.

In the analysis presented in the foregoing section on Tariffs and Trade, it was indicated that the Canadian plastics processors surveyed would be in a position to be competitive in the marketplace with their U.S. counterparts if the Canadian tariff was not subjected to full Swiss formula cuts at the GATT negotiations and if the assumptions related to their relative cost competitiveness could be achieved, particularly that manpower cost parity between the two countries could be realized. Since these changes at best will be slow in coming, a more favorable corporate tax rate in Canada is required.

In today's situation, with 15 per cent higher wage rates, somewhat higher raw material costs, and as yet no results from efforts to improve industry structure, the industry should be able to accomplish returns on investment equivalent to the U.S., at U.S. dollar parity with rates of taxation of about 30 per cent and current duties.

In the future, if there is a reduction in the labor rate disparity from 15 per cent to five per cent, the productivity disadvantage is reduced by about 20 per cent, and import duties are cut 25 per cent, a tax rate of about 37 per cent would be required to be competitive.

The value of the Canadian dollar is a key factor in the assessment of taxation rates required for maintenance of industry competitiveness. As noted previously, the Task Force was of the view, however, that recommendations should be made on the basis of equivalent currency values.

The Task Force is also of the view that there is a need to adjust taxation to take account of inflation, to encourage exports, and to continue special assistance to small business.

Specifically:

- (i) Governments should be prepared to reduce the tax on corporate profits to about 35 per cent. If the impact on government revenue from this measure is too severe, other offsetting tax measures should be looked at to reduce the loss in government revenue, such as an increase in the federal sales tax.
- (ii) Governments and business, assisted by the accounting profession, should continue to examine the desirability and feasibility of incorporating inflation accounting into the tax system. Until the inflation accounting question is resolved, the Federal Government should tie the three per cent inventory tax credit to the implicit price deflator on an annual basis.
- (iii) If item (ii) is not acceptable, then it is recommended that an L.I.F.O. inventory valuation system be introduced for tax purposes only. The final resolution of this area would also have to await agreement in the matter of inflation accounting, but in the interim period this would be of assistance.
- (iv) Maintain the current level of taxation for small business.
- (v) Examine the feasibility of incorporating the most desirable features of the proposed Toronto-Dominion inverted value-added tax system into the existing corporate tax system.

## B. Market Growth

The Task Force believes it to be important that the growth targets in the Department of Finance document of February 1978, entitled "The Canadian Economy - Medium-Term Projections and Objectives", should be closely co-ordinated with those of industry. These projections currently seem to have little credibility in industry groups.

The most important opportunity for the plastics processing industry sector is the large expected growth in consumer and industrial demand for plastic products projected through 1985 of about 10 per cent per year. Based on historical data, it has been estimated that this rate of growth can be supported by a GNP growth of 4.5 per cent per year. However, during the period 1975 to 1977, there was only a 2.7 per cent annual growth in plastics processing industry shipments by Canadian firms while GNP growth in this same period was approximately 2.9 per cent per year.\* This slowing in growth by domestic manufacturing participants has been at least partly attributable to the increasing share of the domestic market taken by imports due to the declining competitive environment for the industry. The consensus within the Task Force was that the opportunities for plastic products as a result of energy-conservation programs, productivity improvements achieved through the redesign of component parts to permit their more rapid and economical production in plastic materials, and the continuing acceptance of increased use of plastics in large volume markets such as packaging, automotive, and construction should result in a long-term growth rate substantially above that of GNP and consistent with the average annual rate of growth projected of 10 per cent through 1985 if GNP through the period grows at 4.5 per cent.

If the Canadian plastics processing industry can achieve international competitiveness, it will be in an excellent position to acquire a major share of this estimated rapid growth in market demand. This would enable the sector to make a considerably greater contribution to the economy as a whole than can be expected from most other major sectors of manufacturing, as well as making an essential contribution to the prospects of the petrochemical industry.

Furthermore, federal, provincial, and municipal governments are large purchasers of manufactured products, and, as such, represent a major potential market for Canadian plastics processors. In addition, governments have the power to influence suppliers to be conscious of, and to increase, the Canadian content of their products. If governments actively pursued a Buy Canadian policy, the result should be substantially increased market opportunities.

The Task Force is aware of certain government procurement practices which do not favor domestic suppliers, specifically those rules set out in Costing Memorandum 1031 of the Federal Department of Supply and Services. Among the rules in Costing Memorandum 1031 are ones which exclude from consideration in the cost of performing a particular contract, interest on invested capital, on bonds and on loans; other finance charges; and selling expenses. In the view of the Task Force, these are normal business expenses associated with doing business with government which should not be excluded from the costs related to a particular bid.

The Task Force also advocates that industry and labor rally behind broad government initiatives to buy Canadian through active, visible, resourced programs by labor and by industry associations such as Canadian Manufacturers' Association, Canadian Chemical Producers' Association, The Society of the Plastics Industry of Canada, and others. The objective of such efforts would be to raise the consciousness of Canadians with respect to the quality of Canadian products and the benefits Canadians would derive through greater buying of domestically produced products. In this respect, the Task Force was pleased to

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\* Source: Bank of Canada Review  
March, 1978

note the announcement in May, 1978 by the Minister of the Department of Industry, Trade and Commerce, the Honourable Jack Horner, of the introduction of a "Shop Canadian" promotional program whereunder Canadian consumers will be encouraged to purchase Canadian-made goods.

To improve the market prospects for plastic products, the Task Force makes the following recommendations.

Specifically:

- (1) Governments should actively support measures which are supportive of the "Medium Term Recovery Path" indicating an annual growth in Canadian GNE through 1981 of 5.5 per cent in the February, 1978 Department of Finance projections and targets for Canada's economy.
- (ii) The Federal Department of Industry, Trade and Commerce should provide funding through departmental programs to study and support the establishing of export consortia in the plastics processing sector.
- (iii) The Department of Industry, Trade and Commerce and the industry through The Society of the Plastics Industry should jointly examine ways and means to promote greater export of plastic products by individual companies through existing or possibly new programs.
- (iv) Governments through their purchasing departments should implement a "Buy Canadian" policy at least as strong as those existing in the United States. This policy should be extended by instilling a strong awareness of the importance and desirability of buying Canadian-made products, both at the level of the prime contractor and at the level of the sub-contractor or supplier to the prime contractor.
- (v) Existing regulations of government procurement departments should be carefully reviewed to ensure that legitimate business expenses, including selling expenses and finance charges, are allowed as costs in negotiated contracts.
- (vi) Government departments and agencies should make efforts to develop Canadian sources where none exist.
- (vii) Governments should urge other groups, including the Canadian Manufacturers' Association, the resource industries, the transportation sector, retailers and others to implement strong "Buy Canadian" policies in their business dealings.

#### C. Regulations

The Task Force accepts the need for regulations to protect the safety and welfare of the Canadian worker and consumer. However, the form of these regulations and their administration are of very considerable concern to the Task Force.

This concern arises from five general areas:

- (1) the real applicability of the regulation to the Canadian environment,
- (2) the number and complexity of regulations,
- (3) the form of administration of the regulations,
- (4) the proliferation of authorities which claim jurisdiction over the various areas without much co-ordination between them, and,
- (5) the trend in legal judgements toward strict liability which may result in very costly claims without negligence being proved.

Regulations dealing with the work place and products sold are a jungle of confusion for the industry and labor.

Lack of sufficient information, pressures to respond, and lack of trained resources in industry, labor, and government often result in overly stringent legislation and regulation, conflicting and over-lapping jurisdictions, and lack of trained people for intelligent enforcement. This situation not only adds unnecessary cost to industry, but can slow down and actually stop desirable investment.

As an example of an unnecessary cost, the Task Force is aware of a trend towards introducing Canadian standards which are little more than a copy of foreign standards while requiring Canadian industry to re-test its products in accordance with these standards. This forces Canadian industry to bear the costs not only of compliance with Canadian standards but of this additional qualification testing as well. These are no less burdensome than in the foreign country, and must be charged against a much smaller level of sales because of the much smaller Canadian market.

This area is very complex and outside the capability of the Task Force to deal with in further detail in the time available. However, the Task Force makes the following broad recommendations.

Specifically:

- (i) Governments should give careful consideration to both the costs and benefits before introducing new safety, environmental, and health-related legislation.
- (ii) All new health and toxicological legislation covering the manufacturing industry should be carefully scrutinized by knowledgeable representatives of industry, labor and the medical and scientific communities.
- (iii) Provincial governments should assess legislation for consistency both nationally and in some cases internationally, to ensure that any inconsistencies are fully justified in an economic sense.
- (iv) Regulations stemming from legislation should be scrutinized in a manner consistent with recommendations (i) to (iii).
- (v) Governments should ensure, by legislation if necessary, that manufacturers be held liable only for defects or results which they can reasonably be expected to foresee.

#### D. Technology and Innovation

Technology and innovation are important to the industry if it is to keep pace with international competition and if it is to serve the needs of Canadians. In many areas of technological development, it will not make sense to compete against industrial giants like the United States. However, there is a need to have a capability to develop products uniquely suited to Canadian needs in areas such as housing and transportation. There is also a need to ensure that plastic processors are up to date with respect to the most efficient manufacturing methods and the best raw materials.

The small and medium-size companies often do not have in-house Research and Development facilities. They rely for assistance on both resin producers and machinery manufacturers. Most of the development in these areas originates in the United States or Europe. As a result, the Canadian processor is in danger of being behind foreign competitors in these areas. Governments and industry should pursue methods of improving these structural impediments to a greater R&D effort in the sector as well as maintain an adequate stimulus for individual company R&D keeping in mind existing activities of such agencies as the National Research Council, the Design Council of Canada and the Enterprise Development Program.

The concept of a Plastics Institute was considered by the Task Force. Conceptionally such an Institute would be self-supporting or supported by plastics industry companies, or both; although in its formative years, some governmental financial support could be necessary. The Institute could provide services to its members in a number of areas including standard and certification work, technological research and development, testing projects (fire, weathering, automotive qualification, general), and international technology transfer.

Specifically:

- (i) The federal Department of Industry, Trade and Commerce and The Society of the Plastics Industry should evaluate the desirability and feasibility of establishing a Plastics Institute in Canada.
- (ii) Governments should continue to encourage and support plastics processing technology exchange missions, particularly to Europe and the United States.
- (iii) Adequate stimulus to increase R&D activities should be maintained.

#### E. Statistical and Management Information

The type and grouping of statistical information for manufacturing and trade in this sector constitutes a constraint to sound industry planning and policy formulation. Additionally, many companies in the sector have misleading or insufficient management information to guide corporate decisions and strategy. Governments and the industry should pursue ways and means of improving the current level of statistical and management information available to the sector.

Specifically:

- (i) The Society of the Plastics Industry, Statistics Canada, and the Department of Industry, Trade and Commerce should collaborate in an effort to improve the statistical data available to the sector. In addition, it should be determined whether a Plastics Institute or some existing organization would provide plastics processors with a source of management information.

#### IMPACT

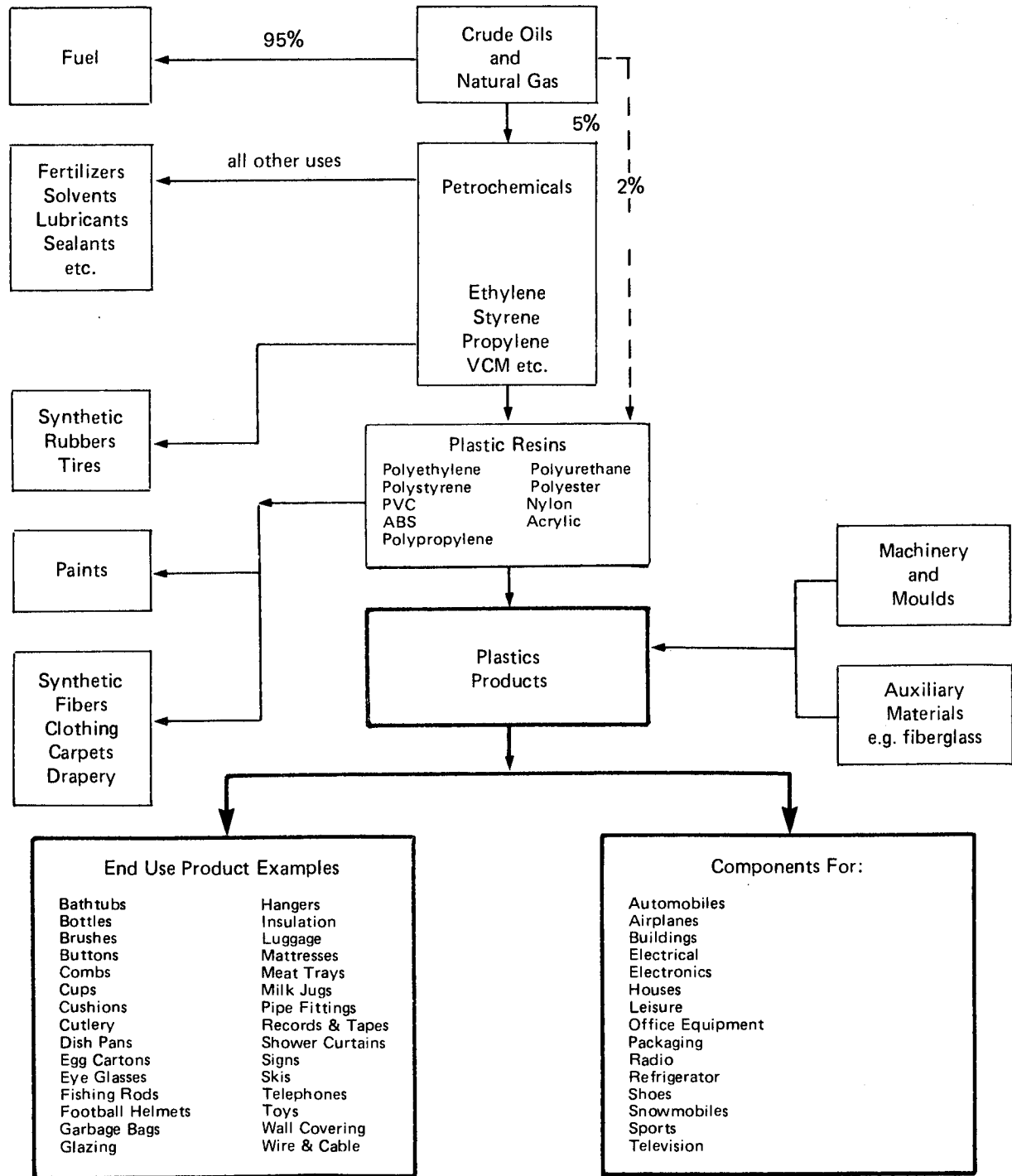
As previously stated, the objective of the Task Force is a set of recommendations which will contribute to the development of a responsible, prosperous, internationally competitive plastics processing industry in Canada. If satisfactory progress is made in implementing the foregoing recommendations related to costs, tariffs, and taxation, then a more cost-competitive industry will result. The benefits should be derived from significant improvements in both domestic market share and volume of exports. It is conceivable that over the short term imports could be reduced from a level of about 25 per cent of the domestic market to about 20 per cent and exports raised from about eight per cent (1977) to 10 per cent of industry shipments. This would mean a reduction in the unfavorable trade balance from \$560 million to \$320 million or a reduction of about 43 per cent in the unfavorable trade balance.

This has the potential to increase domestic production by nearly 10 per cent, an improvement in utilized capacity from 65 per cent to 71 per cent and an increase in employment of possibly 4,000 workers.

If recommendations on economic and market growth are realized, industry employment could be 25,000 greater by 1985 than in 1977 and industry shipments would be approximately \$5 billion, expressed in 1977 dollars.

Implementation of the recommendations related to technological support, improvements in statistical and management information, and regulatory legislation all would make a further positive contribution to facilitating growth and development of the industry.

# The Plastic Industry



Plastics Processing Section in heavy lines

Information Used to Aid Compilation of the Reports

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The following profile of the Canadian Plastics Processing Industry was developed by the Sector Task Force on the Canadian Plastics Processing Industry from a profile prepared by the federal Department of Industry, Trade and Commerce.

**SECTOR PROFILE**

**THE PLASTICS PROCESSING INDUSTRY**

# THE PLASTICS PROCESSING INDUSTRY

## STRUCTURE

### Definition

The plastics processing industry includes companies involved in transforming plastics materials, shapes or other forms into finished products or parts using typical plastics processing methods such as extrusion, injection moulding, thermoforming and blow moulding. Companies which process plastics according to the above definition are distributed among more than 40, three-digit SIC classifications, one of which (SIC-165) is identified as the plastics fabricating industry. Approximately one-half of the industry's shipments fall within SIC-165.\* Plastics processing companies operate within such diverse fields as film and sheet extrusion, wire and cable manufacture, and automobile and boat manufacturing, having in common the use of synthetic resins and plastics processing technology.

Business practices in the industry fall generally into three categories. Some plastics processors manufacture and market their own proprietary products whereas others produce on a custom basis and still others are captive operations within a larger manufacturing entity. While many establishments are engaged in more than one mode of business activity, 58 per cent of the establishments derive the major portion of their sales volume from proprietary products; 17 per cent produce largely on a custom basis and 10 per cent produce captively consumed products. The balance is difficult to characterize due to the mixture of their business activities.

### Products/Markets

Plastic products are used throughout the economy. The major identifiable markets are shown in the following table together with the proportion of total plastic resins consumed by each market in Canada in 1975.

<i>Market</i>	<i>Proportion of Total Plastics Resin Consumption* (Per Cent)</i>	<i>Typical Product</i>
Packaging	36	Milk Pouches
Building and Construction	19	Insulation
Home and Commercial Furnishings	9	Cushioning
Transportation	7	Automobile Interior Finishes
Industry and Utilities	5	Piping and Ductwork Wire and Cable Coating
Leisure	5	Boat Hulls
Communication and Electronics	5	Telephones, Business Machine Housings
Agriculture	4	Drainage Tile
Disposable Serviceware	3	Cutlery, Cups, Bowls
Housewares	3	Garbage Receptacles
Others	4	Luggage, Signs
	100	

\*Resin processed by Canadian manufacturers in 1975

### Number and Size of Firms

There are approximately 1,400 establishments in the plastics processing sector in Canada, of which 60 per cent have annual sales of less than \$1 million. In spite of this, companies with sales of \$2.5 million and more account for 73 per cent of industry shipments and for 60 per cent of total employment.

\* This profile is largely based on information contained in the Department of Industry, Trade and Commerce studies — The Plastics Processing Industry in Canada and A Statistical Profile of the Plastics Processing Industry in Canada. In addition, Statistics Canada data pertaining to the Plastics Fabricating Industry, SIC-165, have been used extensively.

### Distribution of Company Size (1974)

<i>Shipment Value per Establishment (\$000)</i>	<i>Proportion of Establishments (Per Cent)</i>	<i>Proportion of Employment (Per Cent)</i>	<i>Proportion of Total Shipment Value (Per Cent)</i>
Less than 250	26	5	2
250-999	32	15	9
1000-2499	21	21	16
2500-4999	11	18	20
5000-and over	10	41	53
	100	100	100

### Geographical Distribution

The industry is highly concentrated in Quebec and Ontario as shown in the following table:

### Employment and Value of Shipments by Region (1974)

<i>Region</i>	<i>Establishments</i>	<i>Per Cent of Total Employment</i>	<i>Shipment Value</i>
Canada	100	100	100
Atlantic Provinces	3	2	2
Quebec	25	24	24
Ontario	56	66	67
Prairie Provinces	8	5	6
British Columbia	8	3	1

In all regions proprietary products account for the bulk of shipments.

### Scale and Specialization

As part of a study of the comparative economics of the plastics processing industry in Canada and the United States, the effects of scale were investigated. For the plastics processing industry, scale is usually achieved by the addition of machines. In this case, the unit costs do not decline appreciably although clearly, overhead costs are distributed over a larger production base. In some cases, scale can also be achieved by substituting one large machine for a number of small machines. In these cases, at capacity operation, significant cost reductions can be achieved in comparison with operation of a number of small machines with a loss of some flexibility. However, it appears that the size of machinery used in Canada and the United States is comparable. Therefore, the competitive advantage the U.S. industry enjoys compared with the Canadian industry as discussed under the heading "International Competitiveness", is not due to differences in production scale.

Another aspect of scale is company scale or firm size. As indicated, 60 per cent of Canadian firms have sales of less than \$1 million. Generally these firms are owner managed and do not have the resources to support specialists in marketing, accounting or technical functions.

Specialization is an extremely important factor in unit costs. In the United States the market size is such that a machine can be used solely for the production of a single product. In Canada, because of the market size and the number of firms operating, most companies are compelled to produce a number of products using the same machine. This leads to higher tooling costs, higher maintenance, more lost machine time for product changeovers, higher materials losses and a reduction in productivity due to the lack of operating experience on any one product. These are the main reasons for the difference in productivity in Canada and the U.S. The value added per employee in Canada in 1974 at \$18,400 was 80 per cent of that of the plastics processing industry in the United States.

## Ownership and Control

Approximately 80 per cent of plastics processing establishments are Canadian owned. These firms – predominantly privately owned – represent 61 per cent of assets and 62 per cent of sales. Based on data reported under the Corporations and Labour Union Returns Act, there has been no significant change in the proportion of foreign control of the Canadian industry over the period 1969 to 1974.

Foreign ownership rises progressively with the firm size from approximately 10 per cent for those selling less than \$250,000 per annum to about 50 per cent for those selling more than \$5 million per annum. Of the 20 per cent of firms which are foreign owned, 72 per cent are located in Ontario and 20 per cent are situated in Quebec.

### Company Ownership by Region (Per cent)

Ownership	Canada	Atlantic Provinces	Quebec	Ontario	Prairie Provinces	British Columbia
Canadian	79	83	83	74	85	97
Foreign	21	17	17	26	15	3

## Factors of Production

The proportion of production cost represented by the various inputs varies considerably from process to process. For the six major plastics processes the following ranges of cost apply.

	Range of Proportion of Costs %
Materials	30-60
Production Labour	8-30
Administration	4- 8
Selling and Shipping	5-10
Capital Related Charges	17-38

The relative intensity of labour and capital varies considerably. Products made from reinforced plastics such as boats and storage tanks are relatively labour intensive with labour representing as much as 30 per cent of full production costs. Pipe and film extrusion is relatively capital intensive with labour representing 8-10 per cent of costs and capital representing 21-38 per cent of full production costs. However, none of the plastics processes is capital intensive by comparison with the petrochemical or similar industries. In plastics processing, the capital investment per production related employee ranges between \$5,000 and \$42,000 compared to about \$200,000 in petrochemicals.

The average hourly wage of production employees in the plastics processing industry in 1974 was \$3.51. This figure is 18 per cent below the average wage rate for all manufacturing industries and 22 per cent below the average of production wage rates for metal fabricating industries,\* reflecting perhaps a somewhat higher proportion of unskilled labour in the plastics industries. In discussions with industry, the difficulty of hiring and retaining suitable labour has been cited as a major problem.

## PERFORMANCE OF THE SECTOR

### Sales

The value of the plastics processing industry shipments of own manufacture was estimated to be \$1.8 billion in 1974, having almost doubled in current dollars since 1969. In constant dollars, shipments have increased 52 per cent over the five-year period or at a compound rate of nine per cent per year. It is estimated that total industry shipments of plastics products in Canada, in 1977, reached \$2.3 billion.

\* The metals fabricating industries, SIC 5-13 were selected for comparison with the plastics processing industry since plastics processing products complement or substitute for many fabricated metals products.

While 91 per cent of the value of shipments of plastic products originate within the Provinces of Quebec (24 per cent) and Ontario (67 per cent), processors within these provinces sell about 50 per cent of their production outside the province of manufacture. Companies in the Atlantic and Prairie Provinces also rely heavily on markets in other provinces. In British Columbia, more than 80 per cent of provincial production was consumed within the province.

Exports amounted to about 10 per cent of total shipments in 1974. The main country of destination was the United States which received 85 per cent of exports. Establishments in the Province of Ontario had the largest share of exports in 1974 with 79 per cent, followed by Quebec with 9 per cent, the Prairie Provinces 6 per cent, the Atlantic Provinces 5 per cent and British Columbia with 1 per cent.

Exports amounted to about 10 per cent of total shipments in 1974 based upon data from the Statistical Profile of the Plastics Processing Industry which included a substantial proportion of plastics automotive parts. However, when based upon SIC-165 industry shipments and exports attributable to this industry sector, exports amounted to about six per cent of shipments in 1974 and eight per cent in 1977. The main country of destination was the United States which received 85 per cent of exports in 1974. Establishments in the Province of Ontario had the largest share of exports in 1974 with 79 per cent, followed by Quebec with nine per cent, the Prairie Provinces six per cent, the Atlantic Provinces five per cent and British Columbia with one per cent.

In 1974, imports identifiable as plastic items were valued at approximately \$540 million or 25 per cent of the Canadian market. Automotive parts represented about \$150 million of this amount. There are numerous imports of articles that are made in whole or in part of plastic materials which are not identified as plastic and for which no value can be estimated.

### Cost and Price Trends

The industry selling price index for the plastics fabricating industry (SIC-165), as reported by Statistics Canada, was very stable over the period 1969 to 1973 increasing from 98.3 to 102.4. In 1974, the index jumped 23 per cent to 126.1 and in 1975 by a further 10 per cent to 138.1. In 1976 the index rose by 3.3 per cent to 142.4, and in the first half of 1977 by 3.6 per cent to 147.6. By comparison the industry selling price index for all manufacturing industries increased from 95.8 in 1969 to 153.7 in 1975, to 161.6 in 1976 and to 171.2 at the end of the first half of 1977.

On the cost side, the plastic resin price index increased from 100.5 in 1969 to 186.6 in 1975, 187.4 in 1976 and 190.1 for the first half of 1977. Plastic resins represent the largest single element of the cost of plastic products. Wages for production employees in the plastics processing sector increased 58 per cent in the 1969 to 1974 period roughly in line with wage increases experienced in the metal fabrication industries (SIC-513) and in total manufacturing industries (SIC-5).

### Profitability/Return on Investment

There is an enormous range of profit performance among plastic processors. As an average, the firms reporting to Statistics Canada under SIC-165 reported a pre-tax profit of 10.3 per cent of sales in 1974 compared with 8.2 per cent in metals fabricating and 8.8 per cent for all manufacturing.

For the five years 1969-1973 the average pre-tax profit on sales for these industry groups was similar. However, return on equity for the plastics fabricating industry was considerably higher than that of metals fabricating and total manufacturing.

### Average Pre-Tax Profit on Sales, Assets and Equity 1969-73

	<i>Sales</i>	<i>Per Cent Assets</i>	<i>Equity</i>
Plastics Fabricating Industries			
SIC 165	6.5	9.3	24.8
Metals Fabricating Industries			
SIC 5-13	6.4	9.8	17.7
Total Manufacturing Industries			
SIC 5	6.6	8.7	17.0

No distinct pattern of profit performance by process, product or region has been identified. However, it does appear that in general, profit as a per cent of sales drops when firms go through a transition from the entrepreneurial firm, run by an owner-manager, to a firm requiring a second echelon of management and further capital. As the size of the firm further increases, profits improve until other transition points are reached.

## Capacity

The productive capacity of the plastics fabricating industry (SIC-165), as measured by the gross capital stock in constant dollars, grew at an average rate of 12.3 per cent per year over the 1969/74 period. The index of utilized capacity over this time span declined from 1969 to 1970, progressively rose to a maximum in 1973, then declined 25 per cent by 1975.

### Capacity Utilization Indexes (1973 = 100)

	<i>Total Manufacturing (SIC-5)</i>	<i>Metals Fabricating Industries (SIC-5-13)</i>	<i>Plastics Fabricating Industries (SIC-165)</i>
1969	98.9	102.0	89.8
1970	93.3	96.7	83.9
1971	93.8	94.2	88.6
1972	96.3	95.8	93.9
1973	100.0	100.0	100.0
1974	98.2	98.6	90.9
1975	89.7	90.7	74.6

The 1973-75 decline of 25.4 per cent in capacity utilization for the plastics fabricating industry was more severe than for the metals fabricating industries (9.3 per cent) and all manufacturing (10.3 per cent). This decline was due to the business recession of 1974/75 and to a major addition to fixed assets in the 1973 to 1975 period. In that period, expenditures for fixed assets were 62 per cent greater in constant dollars than in the previous three-year period.

The absolute level of utilized capacity in the plastics processing industries was 62.4 per cent on a five-day week, 24 hours per day production basis in the first six months of 1975, or 44.5 per cent when based upon 7 days, 24 hours per day operation. While the approach to continuous operation varies throughout the industry in Canada and depends upon market conditions, labour availability and characteristics of the process, it appears that the U.S. industry is much more strongly oriented to continuous operations. The higher the proportion of available time that machinery and equipment can be operated, the lower the unit costs will be.

## Employment

Employment in the plastics processing industry sector has increased from about 34,000 in 1969 to somewhat more than 45,000 in 1974, an increase of about 32 per cent. Approximately 65 per cent of the industry employees are job trained production workers, 14 per cent are skilled tradesmen and 21 per cent are supervisory, clerical marketing and managerial employees.

Employment in the total of manufacturing industries (SIC-5) during the 1969/74 period grew 7 per cent and in the metal fabricating industries (SIC-513) employment grew 9 per cent. The number of employees in the metals fabricating industry is about 3.4 times the number in the plastics processing industry. However, in the five-year period 1969/74 the plastics processing industry created about 11,000 new jobs against 12,700 in the metals fabricating industry.

## Productivity

The value added per employee in the Canadian plastics fabricating industry was \$18,400 in 1974, roughly 80 per cent of the equivalent figure in the United States.

In Canada, value added per employee for total manufacturing (SIC-5) and metals fabricating (SIC-513) in 1974, were 15 per cent and 12 per cent higher, respectively, than that of plastics processing. In the U.S. the



differences were 6 per cent and 4 per cent for total manufacturing and metals fabricating, respectively, compared with plastics processing.

The gap has been closing in Canada: the average annual increase in value added per employee from 1969 to 1974 has been 4.4 per cent for plastics processing, 3.7 per cent for metals fabricating and 2.7 per cent for all manufacturing.

### International Competitiveness

As part of the ITC study of the plastics processing industry, a comparison of the economics of fabricating plastics products in the U.S. and in Canada was carried out by Woods Gordon & Company with the assistance of a U.S. consulting firm. The study, based on a sample survey of U.S. and Canadian firms, indicated that excluding capital charges, the Canadian industry in 1975 was at an average 15 per cent cost disadvantage.\* In that study, the cost disadvantage due to raw material prices and scrap losses represented 43 per cent of the total cost differences. The following table shows the elements of this cost difference.

#### Canadian Cost Disadvantage

	<i>Contribution to Total Difference</i>	<i>Proportion of Total Cost Difference %</i>
1. Raw material costs due to price differences and higher scrap losses	6.4	43
2. Labour costs due to lower productivity	5.0	33
3. Maintenance costs due to less specialization leading to more frequent tooling changes and more tool servicing	3.0	20
4. Other, including royalties, municipal taxes, insurance	1.8	12
5. Lower utilities costs	(1.2)	(8)
	15.0	100

This study included data on capital costs, but the data collected was not on a uniform basis and could not be included with the overall analysis. However, it can be estimated that the cost disparity would increase by 2.5 to 3 percentage points if capital costs were included. This is due to a number of factors. Machinery, equipment, construction and installation costs are higher in Canada. Tooling costs are higher because Canadian plants produce a greater variety of products. Since Canadian plants produce a greater variety of products, the output for an equivalent production machine is lower in Canada due to the downtime for tooling changes and due to a lower experience factor on each individual product.

Wage rate differences were mixed and relatively small and are not considered a major factor in this analysis. However, since 1974 average wage rate differences in plastics processing have increased substantially. In 1977, average wages in Canada in plastics processing were 15 per cent greater than in the United States, according to a survey conducted by the Society of the Plastics Industry in Canada and the U.S.

## OPPORTUNITIES AND CONSTRAINTS

### Demand

The major opportunity for the Canadian plastics industry during the 1975/85 decade lies in the expected growth in the level of consumer and industrial demand for plastics products.

During the 1975/85 period, the industry expects a 10.7 per cent annual average increase in the quantity of plastics resins to be consumed in satisfying currently identifiable markets. This rate of increase can be compared to an 11.1 per cent per year growth in consumption during the 1965/75 decade. The factors underlying this predicted growth in plastics processing are a continued moderate level of economic growth

\* This analysis was based on parity between the U.S. dollar and the Canadian dollar.

supported by current trends in population, the replacement of traditional materials stimulated by energy conservation measures and continued growth in the manufacturing sector of the economy. Provided the ratio of growth rates of plastics consumption to GNP observed over the 1965/75 decade (2.4:1) holds true for the present decade then the industry estimates of demand can be supported by an annual GNP growth of 4.5 per cent.

**Summary of Market Projections**  
**Million pounds of resin processed in Canada**

	1975	Growth Rate Per Cent Per Year	1980	Growth Rate Per Cent Per Year	1985
Packaging	570	(10)	915	(9)	1,396
Building and Construction	292	(15)	595	(12)	1,052
Home and Commercial Furnishings	145	(7)	202	(7)	284
Transportation	113	(18)	262	(11)	447
Leisure	79	(10)	130	(10)	210
Industry and Utilities	76	(12)	135	(9)	209
Communications and Electronics	73	(10)	114	(10)	181
Agriculture	69	(11)	113	(6)	150
Disposable Serviceware	58	(15)	118	(9)	170
Housewares	53	(13)	98	(11)	167
Apparel and Accessories	27	(6)	36	(6)	48
Advertising and Publications	6	(10)	10	(10)	16
	1,561		2,728		4,330
Growth rate of total identified markets (%/year)		11.8(1975-80)		9.7(1980-85)	

Overall, the value of shipments of this industry could exceed \$3 billion in 1980 and \$5 billion in 1985 expressed in 1975 dollars. There is potential for additional growth in exports and growth due to direct replacement of imported components, but any significant change will require improvement in the international competitive position of the industry.

**Raw Material Supply and Price**

Canada is not self-sufficient in the supply of many raw materials used by the plastics processing industry. Domestic production currently provides about 70 per cent of plastics resins used. However, the Canadian market is not large enough to justify domestic production of hundreds of essential plastics additives, many specialty grades of commonly used resins and a number of engineering resins used in relatively low volume. During 1973 and the first half of 1974 a high level of domestic and world demand for plastics products created widespread shortages of plastic resins. However, the economic downturn, which began late in 1974, eliminated the problem of resin shortage and resin supply has not constituted the constraint to growth that was foreseen at the time.

The largest single direct cost of manufacture in plastics processing is the cost of plastics resins, end-products of the petrochemical industry. Prices of resin manufactured in Canada virtually always have exceeded world prices. Nominally, resin prices have been about 10 per cent more than the price of equivalent materials in the U.S., reflecting the import duty (generally 10 per cent) and the limited domestic supply. In large part higher domestic prices are explained by the smaller, less efficient production units and the generally higher costs of capital equipment and plant operation in Canada.

A further constraint related to raw material pricing which has been frequently cited by Canadian processors is the buying power of large U.S. processors. Such an advantage makes exports of fabricated products more difficult for Canadian processors and at the same time partially offsets the effect of Canadian import duties on plastics products.

Although Canadian plastic processors support the need for reliable domestic sources for most of their resin requirements, they believe that they can only be internationally competitive if Canadian suppliers offer these resins at prices equivalent to prices in the U.S. Higher resin prices have been shown to adversely affect

average total direct manufacturing costs, excluding the effect of capital related costs, by about 5 per cent or the extent of about one-third of the total cost disparity of Canadian processors with respect to comparable processors in the U.S.

On completion of major petrochemical expansions in Alberta, Ontario and Quebec it is anticipated that Canadian manufacturing capacity for the five most important plastics resins, which represent 80 per cent of Canadian resin consumption, will be adequate to meet Canadian requirements in the 1980-85 period. Based upon anticipated patterns of usage, imports of plastics resins are expected to fall from the current 30 per cent of domestic requirements to about half this amount in the 1980-85 period.

For a number of resins, particularly the engineering resins such as the acetals and polycarbonates, the Canadian market is not large enough to justify domestic production. Therefore, buying from foreign suppliers, particularly U.S. suppliers, will continue for several years.

There are indications that resin prices in Canada are now becoming more competitive with U.S. and other international prices. Canadian resin producers have been more aggressive in marketing in anticipation of their new resin capacity. It is also understood that, in most cases, domestic resin producers will make resin available to Canadian manufacturers for products they export at prices equal to those paid by U.S. plastics processors for similar quantities of resin.

### **Manpower**

By 1985, industry employment will increase by between 15,000 to 30,000 to reach a total of 60,000 to 75,000 assuming industry production increases by 8 to 10 per cent over the period and productivity improves by 5.0 per cent per year (the industry performance between 1969 and 1974). A 30,000 increase in employment would represent 10 per cent or more of the expected increase in the total manufacturing sector labour force. However approximate this forecast may be, it would appear that the plastics processing industry will be in an increasingly competitive market for production labour over the next decade. Approximately 65 per cent of the employees of the plastics processing industry are job-trained production employees for whom secondary school education is not required. The proportion of the Canadian labour force made up by this category was 62 per cent in 1971. It is expected to decline to 49 per cent by 1980 and to 45 per cent by 1985. Since the plastics processing industry employs a higher proportion of unskilled labour than total manufacturing, this industry sector will be constrained in manpower supply to a greater extent.

The difficulty in obtaining an adequate number of journeyman tradesmen and technical employees is another constraint cited by the industry. Training facilities in Canada are said to be inadequate for journeyman tradesmen. In the case of technical employees, industry claims that graduates of technical schools frequently expect supervisory or management positions soon after graduation. The industry believes these graduates require a significant amount of practical experience in lower paid positions before being promoted. Technical school graduates are not found in large numbers in this industry.

Similarly, technical professionals such as engineers or chemists have not met the expectations of the industry. This may be due in part to the absence in most universities of specialized training in plastics processing. However, it may also be due to the relatively little scope for technical work, particularly in small plastics processing firms.

Maximum productivity of capital assets would be achieved if the industry were able to operate continuously, that is, 24 hours a day, 7 days a week. While the more capital intensive segments of the industry approach continuous operation, in general the industry has had difficulty in maintaining an adequate work force for continuous operations.

The industry reports that Canadian workers, particularly young people, do not wish to work in factories and do not wish to work shifts or weekends. To a large degree the industry has relied on immigrant labour, particularly to fill production jobs. However, the industry will have to make greater use of Canadian workers as the number of immigrants coming to Canada is reduced in the face of present high unemployment. In the U.S., a continuous operation is accepted as a far more common industry operating practice. Thus, not only is the Canadian industry at a disadvantage in wage rates but it also claims to be constrained by worker attitudes which inhibit operation on a continuous basis.

### **Capacity Utilization**

Chronic overcapacity has existed in most segments of the Canadian plastics processing industry for many years. To a certain extent this has been due to the high rate of growth in the market for plastics products. Apparently, the cost of carrying surplus new capacity in anticipation of further growth has been

justified in terms of eventually capturing new market opportunities. Unfortunately, when the growth rate declines, as it did in 1975 and 1976, much of the new investment remains unproductive and adds to the cost structure of the firm.

Another fundamental factor in the low plant capacity utilization lies in the previously mentioned extreme difficulty encountered by Canadian firms in attempting to operate multiple shifts per day and more than five days per week.

The fact that it is relatively easy to enter the plastics processing industry and that business can be initiated on a relatively small scale has also contributed to overcapacity. The establishment of small-scale enterprises is perhaps a positive factor in terms of regional development and employment. However, in some cases prices offered by small firms may not fully reflect their costs. The larger firm has higher overheads resulting from technological, market development or engineering activities. In addition, the pricing policies of large firms take full account of costs. As a result, they can experience difficulty in competing profitably with the small firm.

Firms which become large consumers of plastics components tend to manufacture their own requirements once their volume reaches a level which will support the capital and operating costs. This also contributes to overcapacity. Each time this occurs, a portion of either the proprietary or custom markets effectively disappears leaving one or more former suppliers with idle machine capacity and surplus manpower.

### **Capital for Small Canadian Firms**

While there appears to be relatively little difficulty for new entrants to raise the minimal amounts of capital required to start a business, the industry reports a common experience in having difficulty financing expansions. It is claimed that U.S. firms find capital for expansion to be much more easily available through the U.S. merchant banking system.

### **Trade**

A review of Canadian imports of plastics products indicates that there are opportunities for import replacement, particularly within certain market areas such as automotive parts, film and sheet and flooring. Although a multitude of plastic products enter Canada in quantities for which, considering tooling costs and the size of existing markets, domestic production would be difficult to justify, the industry considers that a better identification of plastics products imports would result in greater import substitution.

The expansion of exports of plastics products, particularly to the United States, should be a key objective for the Canadian plastics processing industry. A substantial increase in exports would provide improved production economics by increasing product run lengths and by utilizing surplus capacity. However, a number of problems such as higher Canadian manufacturing costs, a strong buy-American preference and a degree of inertia within Canadian industry must first be overcome.

The plastics processing industry could best pursue an increase in exports by aggressively promoting unique products. Products being successfully exported by a number of Canadian plastics processors demonstrate that well designed products offering advantages, whether aesthetic or functional, can be sold in the United States and other foreign countries in some cases.

While common plastics products are difficult to export because they must be sold in competition with lower cost products with similar features, a few Canadian companies which have specialized in a limited product line have achieved significant levels of export sales in commodity products.

Customs tariffs applicable to most plastics products shipped to the United States are relatively low. For example, plastic pails carry a rate of 8-1/2 per cent, hose, pipe and tubing four per cent, and film six per cent. The Tokyo Round of negotiations should result in yet lower rates of duty in the United States. This would improve prospects for Canadian manufactured products in this market. Reduced duties in other foreign markets should not significantly increase opportunities for exports of plastics products because transportation costs and service requirements mitigate against exports to distant markets. Of course, at the same time, Canadian customs tariffs are likely to be reduced as a result of these negotiations which will result in greater competition from imported products.

### **Statistical and Management Information**

The plastics processing industry as defined in this study is included within 12 major groups of division 5, Manufacturing Industries, of the Standard Industrial Classification. Plastics processing is carried out as part

of the manufacturing activity of establishments which may report to one of nearly 40 possible three-digit industry classifications.

The Plastics Fabricating Industry n.e.s. (not elsewhere specified) (SIC-165) encompassing all plastics manufacturing activities which cannot be conveniently assigned to any market or production classification, accounts for approximately one half of the estimated value of shipments of the plastics processing industry. The identity of a plastics processing industry sector therefore becomes more obscure as plastics processing becomes more diverse. However, within the Plastics Fabricating Industries n.e.s. (SIC-165) several specialized segments of the industry have emerged which are distinctly homogeneous in process methods, products and corporate structure.

The type and grouping of statistical information in manufacturing and trade for this industry can be considered valid areas for improvement since present statistical aggregations frequently constitute constraints to sound industry planning and policy formulation.

Inadequate or misleading management information systems which tend to limit the quality of business decisions have been identified as constraints to improvement in the operating performance of the plastics processing industry. The lack of adequate cost information was a prominent deficiency found to be common to both small and many larger more successful firms. The pursuit of increases in sales volume and corporate growth without sufficient concern for efficient utilization of physical and financial assets was found to be a common practice in the industry.

### **Technology and Innovation**

The development of plastics processing technology largely originates with resin producers and machinery manufacturers in Europe and the U.S. In Canada, customers, resin producers, affiliated companies and patent or technology agreements are major sources of technical input.

In general, it appears that the Canadian industry is behind the U.S., European and Japanese industries with respect to early knowledge of new technological developments. Within the Canadian industry, larger companies have access to a wider range of technology inputs than do smaller companies.

Generally, because of the relatively small size of the Canadian market base, the average Canadian plastics processor cannot justify the expense for an effective research and development activity. Most successful technical initiatives have centred upon productivity improvements on the shop floor level. However, the purchase of foreign machinery and the consequent contact with these machinery manufacturers has furnished a significant technical input to the Canadian plastics processing industry. Canadian resin producers, by and large subsidiaries of multinational organizations, have supplied the developing plastics processing industry with considerable amounts of technical assistance. However, this assistance has decreased in recent years.

### **Industry Image**

The public perception of the plastics industry has an important bearing on its future development. The attitude of architects, designers, environmentalists, consumers and prospective employees towards the industry undoubtedly influence their day-to-day decisions involving selection of materials for construction, selection of purchases and selection of employment.

Following a number of product failures in the early years of plastics processing, public confidence and acceptance has increased slowly as a result of the industry's increased knowledge of the properties of plastic materials, as well as better product design and the use of new types of resins and improved processing methods. It is also important that the public become aware of the contribution plastic products make to energy conservation through the replacement of materials that are less energy efficient.

### **Regulatory Environment**

Increasingly stringent regulations respecting flammability, smoke and fume emission are likely to affect the furnishings and building materials markets in the future. Also, greater concern is being shown for the possible harmful effects that certain plastic constituents can have on the environment, the health of workers and the population generally. These problems could constitute major constraints to the growth of many plastics applications. However, the industry has shown considerable ingenuity in developing new approaches to cope with the limitations of the basic properties of materials and there is promise that many of the remaining obstacles can be overcome.



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