

ASSESSMENT OF OPPORTUNITIES FOR THE
MANUFACTURE OF LOW PRESSURE GAS
CYLINDERS AND TANKS IN CANADA

1973

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Department of Regional
Economic Expansion

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PLEASE NOTE

This report has been edited, where necessary, to remove comments and data that are classed as confidential. In the interest of efficiency, this has been done by simply removing small sections of the report. As a consequence, there are some blank spots which, we hope, will not interfere with the readability of the report.

Department of Regional Economic Expansion

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I - CONCLUSIONS

The market for low pressure gas cylinders and tanks in Canada is divided into four specific segments, each of which is highly sensitive to transportation costs.

The Canadian marketplace for low pressure cylinders is located primarily in Ontario and Quebec, and existing Canadian productive capacity appears adequate to fully service demand for the foreseeable future. Therefore, little justification can be found for establishing a new cylinder manufacturing facility. However, Canada could obtain some benefits by an increase of Canadian content in cylinders currently manufactured, specifically acetylene, mentioned later.

The only apparent opportunity to establish new productive capacity appears to lie in tanks for liquified petroleum gas, an area where the preponderance of sales occurs for domestic heating installations, and as such, Ontario and Quebec decline in importance, and the Prairies, the Maritimes, and possibly B.C. become considerably more importance. Because of the wide dispersion of the market away from Ontario and Quebec, and because of the bulk of the product, some justification can be found for the establishment of a volume tank manufacturer in a regional centre now without one. This is particularly so in British Columbia and the Maritimes. In either of these cases, site selection would be largely a function of distribution costs of end product, coupled with labour availability. Such an industry, as an example, would be ideal for New

Brunswick Multiplex, which would have both readily available labour and a central location for distribution purposes. However, this sub-sector of the market is extremely difficult to quantify in terms of supply because of the diversity in terms of size and manufacturing industry of possible manufacturers, ranging from specialist manufacturers to small fabricating and welding shops. It is therefore recommended that any intending manufacturer undertake a detailed survey of this sub-sector in the geographical area of interest.

The only other methods of increasing Canadian manufacturing content in this area would be to increase the tariff protection granted to Canadian manufacturers of fire extinguishers on finished fire extinguishers, and steel shells for cylinders, or by increasing the Canadian raw material content of acetylene cylinders, an action that Canadian Cylinder is endeavouring to accomplish by a change of accepted manufacturing standards.

II - INTRODUCTION

This report presents the results of a brief analysis of the Canadian market for low pressure gas cylinders and tanks, with the objective of determining whether adequate Canadian production facilities exist for the manufacture of these items, and if not, whether the market size would justify the establishment of such a facility.

APPROACH

The amount of publicly available statistical information relating to this industry is extremely limited, and is further very general in nature. Because of the nature of the market for both high and low pressure gas containers, where in each particular segment except that of tanks only a very small number of companies operate, the policy of Statistics Canada in guaranteeing the confidentiality of their sources makes specific manufacturing data for high or low pressure gas cylinders unavailable, and effectively means that any data available is an aggregate figure for the total market, both high and low pressure.

As a consequence, the examination of this market was conducted largely by personal interviews with manufacturers of cylinders and tanks both in Canada and the United States, major utilizers of gas cylinders and tanks in Canada, trade associations of the various gas manufacturers and certain provincial departments of industry.

As a means of assessing the growth potential of the industry

as a whole, statistical tables and graphic presentation of the same tables are included relating to the total Canadian production for industrial gas, (in terms of dollar value) and Canadian factory shipments of acetylene gas in both dollars and millions of cubic feet. For the purposes of forecasting growth in the industry and relating such growth to the market for gas cylinders and tanks, the domestic consumption of pressure cylinders and tanks is utilized, the domestic consumption being defined as domestic manufacture plus imports. In this particular case, the only relevant exports appear to be those of fire fighting and sanitation equipment NES, which would contain relatively few pressure cylinders. The effect of not including these exports is offset by removing the value of the fire fighting equipment and parts NES imported from the resultant value of domestic consumption.

It should be noted however, that the market for low pressure cylinders is not homogeneous, being composed of distinct, highly different segments with distinct characteristics, all of which are defined and analysed.

III - THE MARKETTHE PRODUCT

A low pressure gas cylinder or tank, for the purpose of this survey, is considered to be a metal tank or cylinder or container which contains a gas or gaseous mixture at a positive pressure differential relative to standard temperature and pressure at sea level (STP). Given that this definition would encompass not only low pressure but also high pressure gas cylinders and tanks, then for the purpose of this specific study, a low pressure gas cylinder or tank is deemed to be a cylinder containing gases at pressures of less than 500 pounds per square inch above atmospheric pressure (psig).

THE PURPOSE
OF THE PRODUCT

As the name implies, a low pressure gas cylinder contains gas under low pressure, either in the gaseous or liquid phase. The bottles are usually filled at a gas manufacturing facility or filling and distribution centre, and are then normally transported by truck to the customer for his own needs. The situation may differ with tanks, for in this case, a special tank truck filled with gas will visit a stationary tank and fill the tank of the customer either by a pumping process or pressure differential process.

Whatever the method, the demand for tanks and cylinders is obviously dependent on the demand and utilization of the contents of

FIGURE 1

CANADIAN PRODUCTION OF ALL INDUSTRIAL GASES

	1961	1962	1963	1964	1965	1966	1967
	Value \$000	Value \$000	Value \$000	Value \$000	Value \$000	Value \$000	Value \$000
FACTORY SHIPMENTS OF INDUSTRIAL GASES (ALL TYPES) AT EX-WORKS PRICE	74,030	81,782	86,380	102,722	112,207	140,077	151,647

Note: Statistics not available after 1967 to protect the confidentiality of contributed data.

Source: Statistics Canada Publication No. 46 219 - Manufacturers of Industrial Chemicals.

FIGURE 2

DOMESTIC PRODUCTION OF INDUSTRIAL GASSES AT EX-WORKS PRICES
(1961 - 1967 DBS) AND PROJECTIONS TO 1972

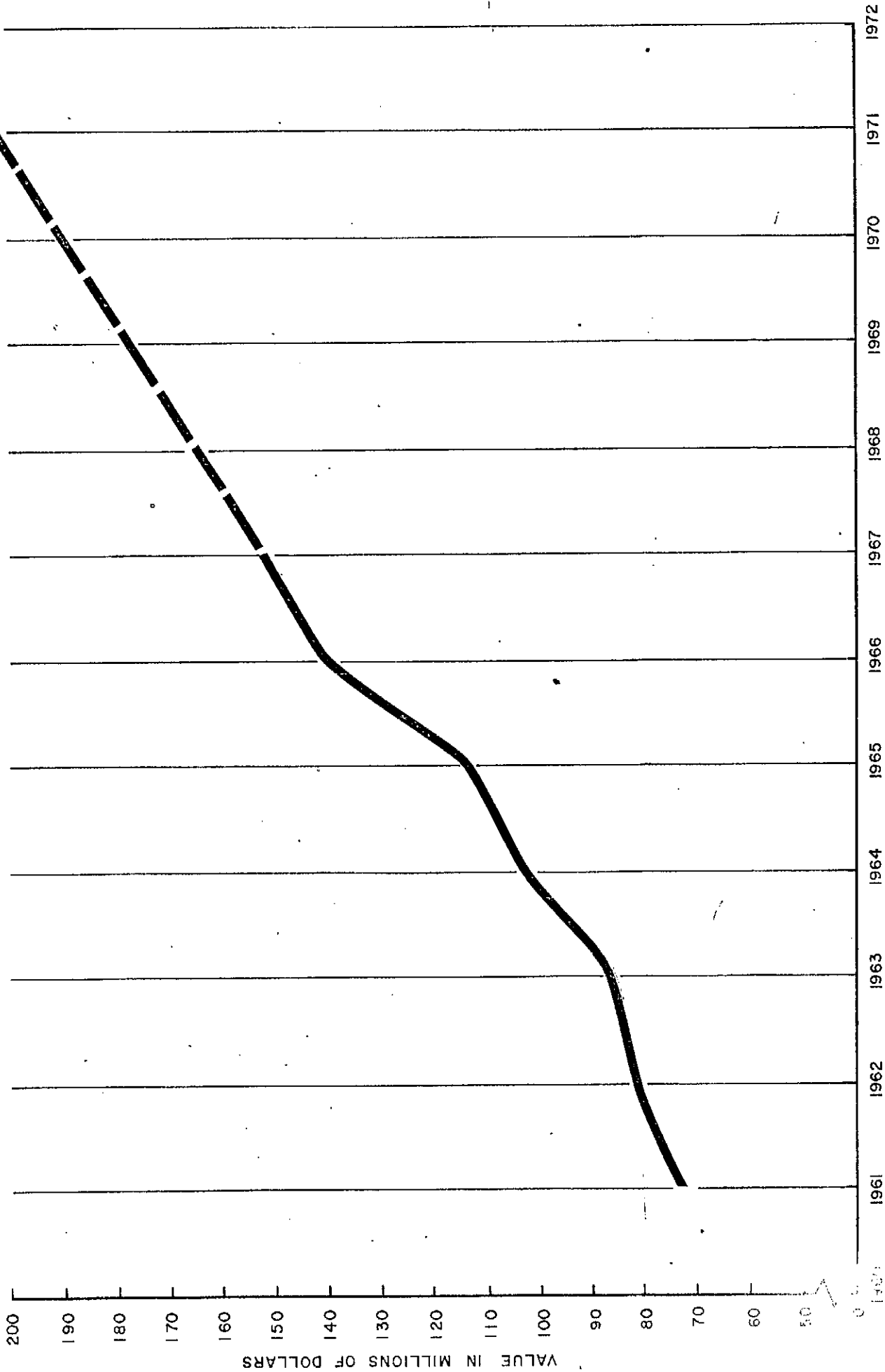


FIGURE 3

DOMESTIC CONSUMPTION OF PRESSURE CYLINDERS & TANKS (HIGH & LOW PRESSURE)

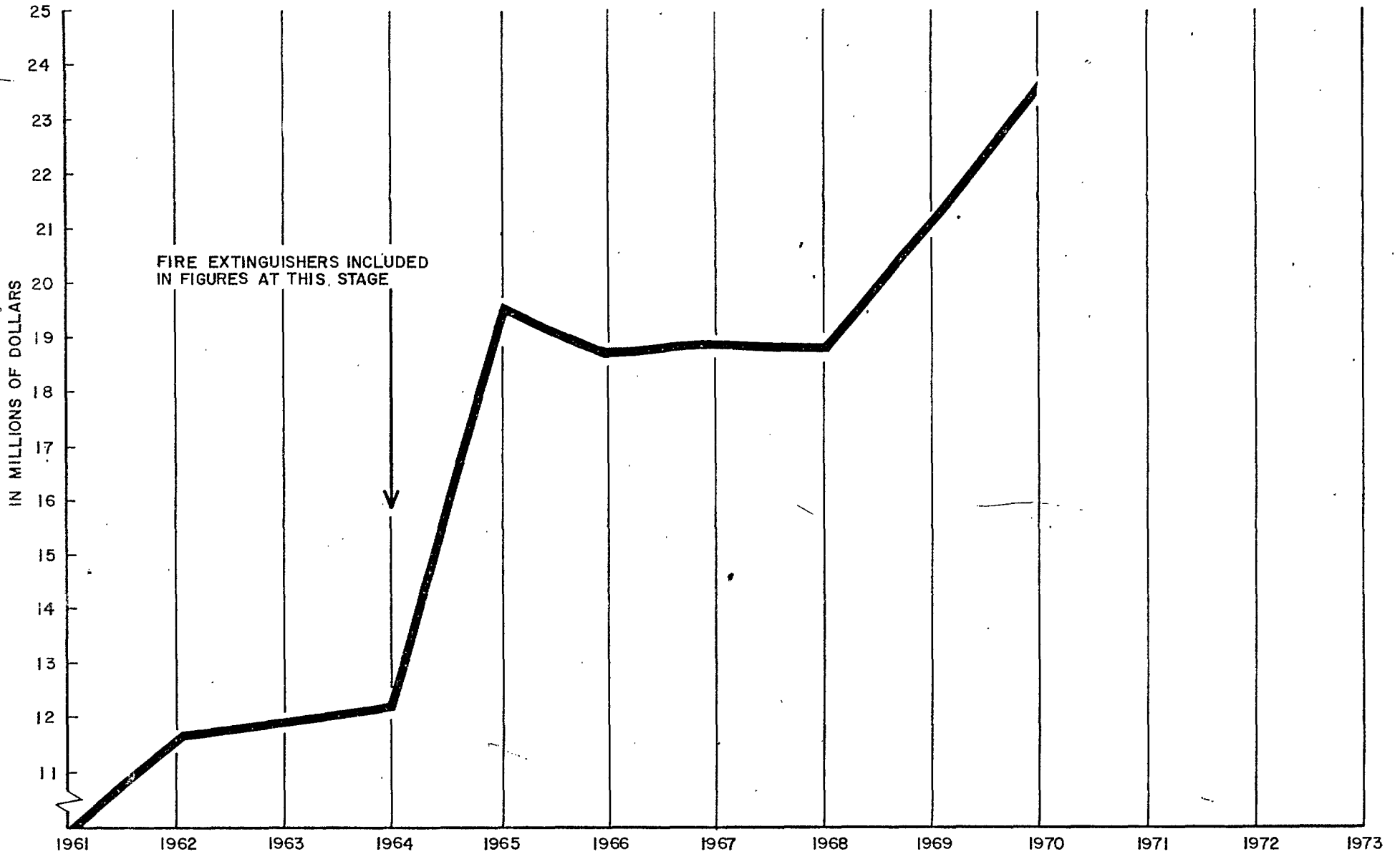
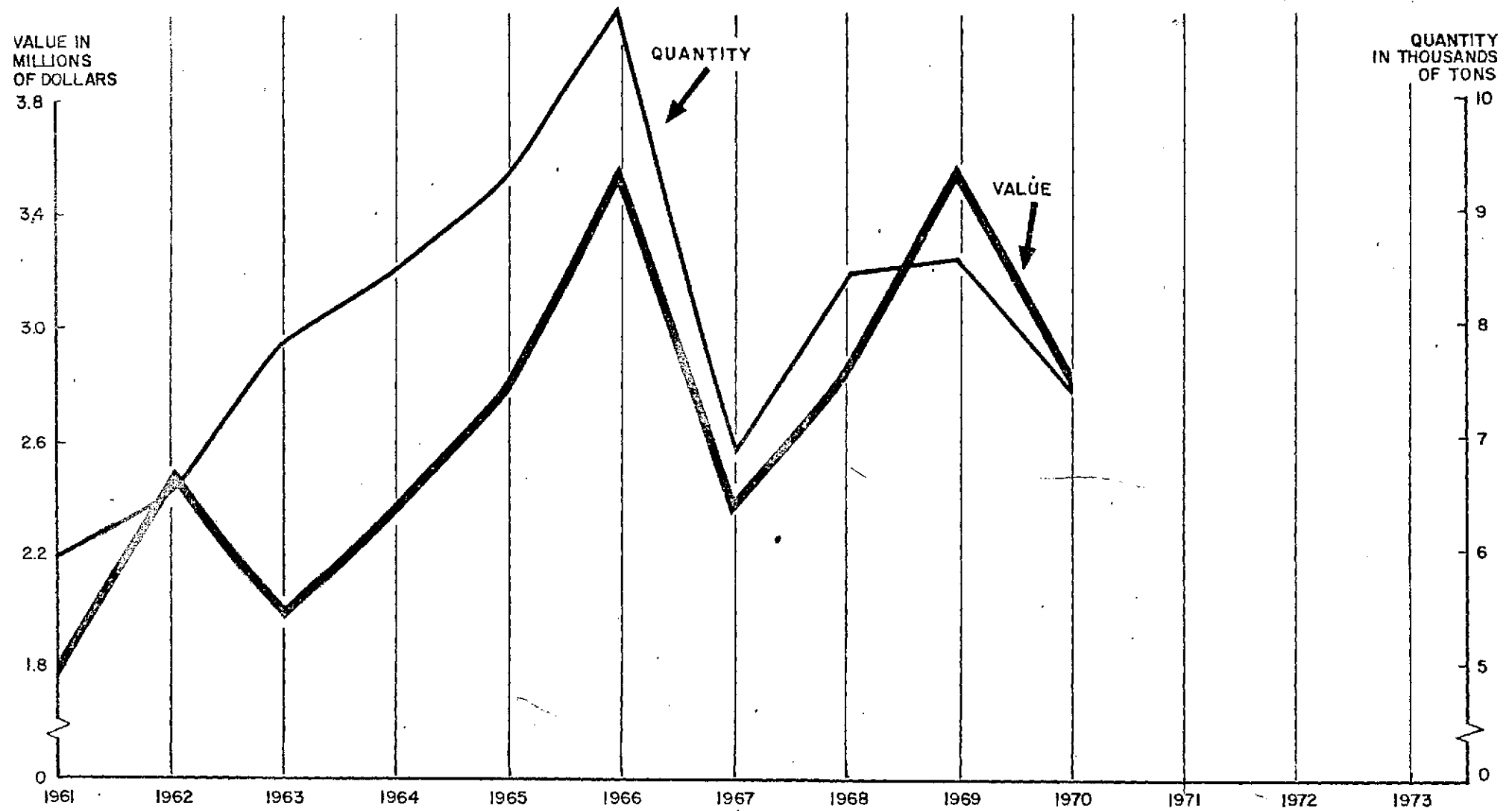


FIGURE 4

MANUFACTURE OF LPG TANKS BY BOILER & PLATE WORKS IN CANADA (1961-1970)



the container, and as such, demand is very closely tied to factory shipments of industrial gases. Figures 1 and 2 opposite show numerically (Figure 1) and graphically (Figure 2) the Canadian production of all industrial gases.

Although these figures contain gases bottled under both high and low pressures, and as such are not directly relevant to low pressure gas cylinders, nevertheless, some indication of the total demand for bottled gases is a useful overview of the market while considering the various segments which are included in the low pressure bottled gas market.

With a similar justification, the domestic consumption of pressure cylinders and tanks, both high and low pressure, from 1961-1970 is detailed in Figure 3, opposite, by value, and of domestic manufacture of gas tanks by boiler and plate works detailed in Figure 4 opposite.

THE CANADIAN MARKET

The Canadian market for low pressure gas cylinders and tanks is not homogeneous, being comprised of four highly distinct and differentiated segments as follows:

- acetylene cylinders
- low pressure cylinders and tanks for noxious gases
- cylinders for low pressure fire extinguishers
- cylinders and tanks for liquified petroleum gases.

FIGURE 6

CANADIAN FACTORY SHIPMENTS OF MANUFACTURED ACETYLENE

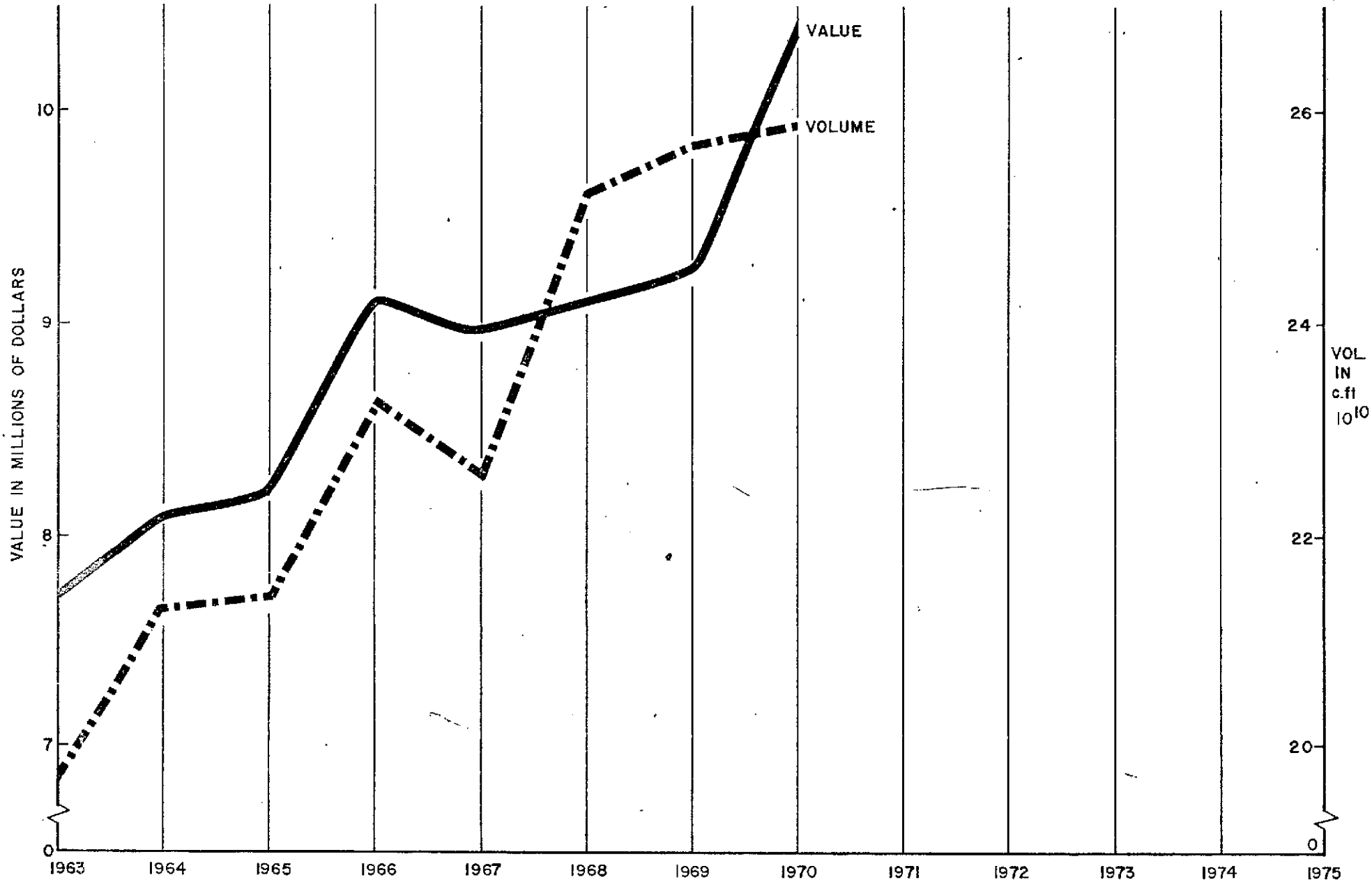


FIGURE 5

CANADIAN FACTORY SHIPMENTS
OF MANUFACTURED ACETYLENE - 1963-1970

Year	<u>QUANTITY</u>	<u>VALUE</u>
	M. Cu. Ft.	\$000
1963	197,463	7,690
1964	213,957	8,109
1965	214,717	8,186
1966	233,075	9,120
1967	225,912	8,974
1968	253,828	9,138
1969	257,022	9,253
1970	259,916	10,397

SOURCE: Statistics Canada Publication 46-219

The total market had a domestic consumption in 1970 of \$23,543,000, of which \$2.5 million would be high pressure cylinders. Therefore, excluding high pressure cylinders, the market would amount to \$21.0 million. It should be understood that this figure includes vacuum tanks and CO₂ fire extinguishers (high pressure) and it was not possible to extract these values from the total. Of this \$21.0 million total, \$3.0 million would be imports (after exclusion of HP cylinders) amounting to 14 per cent of domestic consumption, again, it is stressed, including CO₂ fire extinguishers and vacuum tanks.

Acetylene Cylinders

Canadian production of manufactured acetylene is detailed numerically in Figure 5 and graphically in Figure 6 opposite. However, the critical factor to note is not the historical increase in shipments, but the relative stagnation since 1968. This levelling-off trend continued into 1971, and although an increase is noted in 1972, the prospects for the industry, as far as the supply of cylinders is concerned are poor.

Industry sources state that the demand for acetylene is declining in the United States, and stagnant in Canada. When it is considered that acetylene cylinders have a life of approximately 40 years, and may then be reconditioned, and when further consideration is given to the fact that the four major consumers of these cylinders currently possess in excess of 300,000 units, then it is obvious that any downturn in the demand for acetylene will have a very sharp effect on orders for new cylinders. The prospects for the manufacture of acetylene cylinders is gloomy, due largely to the substitution of acetylene by L.P. gas for industrial cutting purposes.

The total demand in Canada for acetylene cylinders over the past six years has been for 20,000 units annually, and although this increased to more than 25,000 units in 1972, the increase is not expected to be permanent.

The four major consumers in Canada are:

- Canox Limited - Toronto
- Linde Division of Union Carbide - Toronto
- Liquid Carbonic Co. Ltd. - Montreal
- Liquid Air Corp. Ltd. - Montreal.

Cylinders and Tanks
for Noxious Gases

Noxious gases are considered to be Chlorine (Cl_2), sulphur dioxide (SO_2), and anhydrous ammonia (NH_3). Within this particular segment of the industry, gas is bottled either in 150 lb. cylinders or 1 ton tanks, and, again, as a life of 40 years is achieved with cylinders, the market for new cylinders is extremely small, with the bulk of large users being other chemical manufacturers, who purchase the gas by the railroad tank car. Although these are low pressure gases, the lethal effects of the gases, if released, have caused the construction standards for tanks and cylinders to be the same as those for non-lethal high pressure gases, namely, seamless construction. Thus this sector of the market for low pressure cylinders is supplied by the manufacturers of high pressure cylinders due to the similarity in manufacturing methods.

A major cylinder consumer in the industry has estimated total industry stocks of cylinders and tanks as follows:

Chlorine	-	18,700 cylinders
Sulphur Dioxide	-	1,600
Anhydrous Ammonia	-	<u>3,200</u>
Total		23,500 - 150 lb. cylinders

Chlorine	-	4,000 tanks
Sulphur Dioxide	-	240
Anhydrous Ammonia	-	<u>Not used in this size.</u>
Total		4,240 tanks

Industry comment on this sector is that the market for 150 lb. cylinders of chlorine is stagnant, with no significant new markets in sight. As a consequence, orders for new 150 lb. cylinders would be a maximum of 100 units per year.

The market for one ton tanks of chlorine, although only about 100 units a year is growing at a rate 6 to 7 per cent greater than the advance of the economy, for a total rate of increase of approximately 11 to 12 per cent per year. Anhydrous ammonia and sulphur dioxide are both growing at a rate consistent with the advance of the economy, or 5 per cent per year.

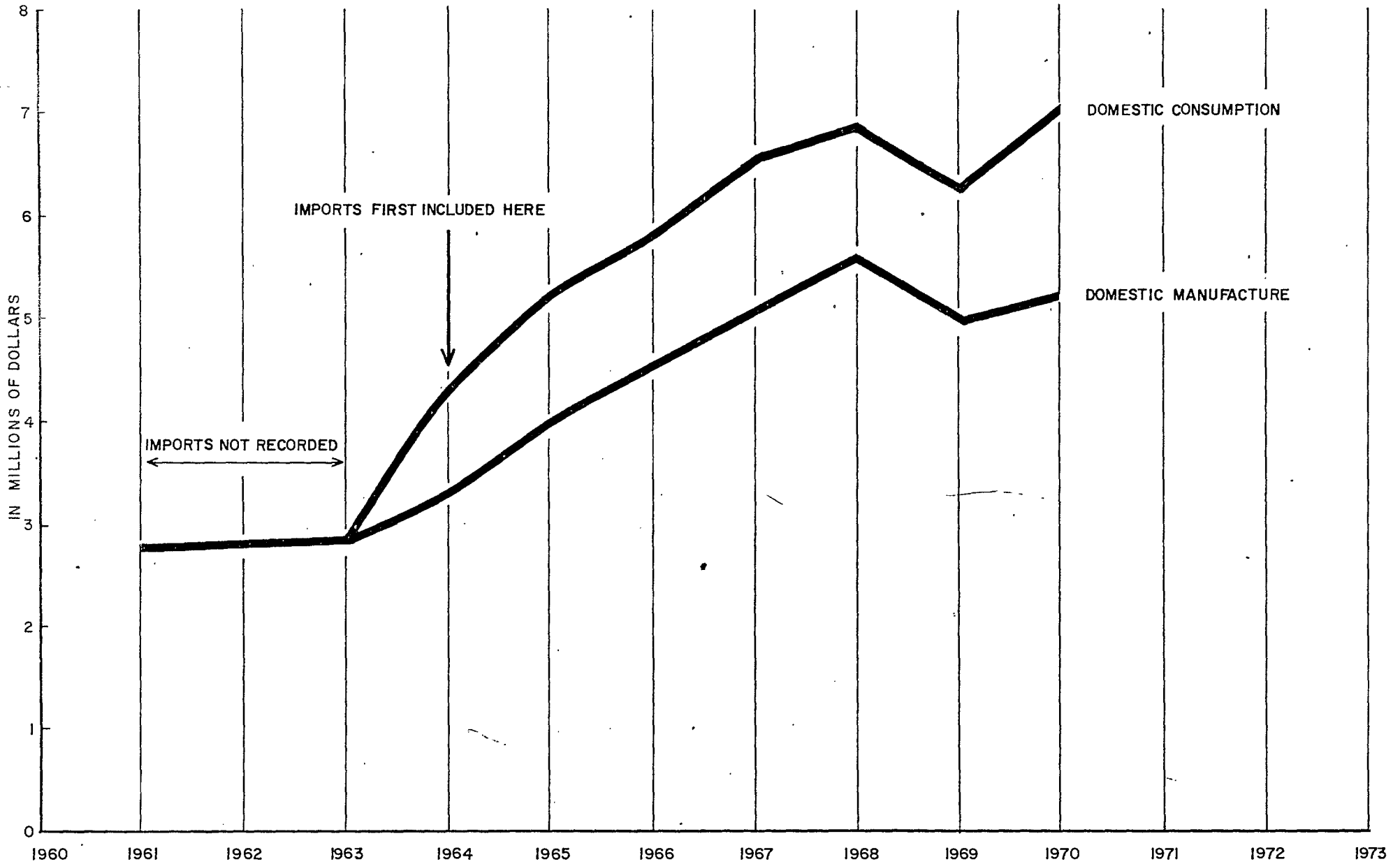
The major consumers of cylinders and tanks for these gases appear to be CIL, Dow Chemical, and Northern Industrial Chemicals.

Low Pressure Cylinders
for Fire-Fighting Equipment

The consumption of hand type fire extinguishers in Canada is

FIGURE 7

DOMESTIC CONSUMPTION OF HAND-TYPE FIRE EXTINGUISHERS IN CANADA (IMPORTS & DOMESTIC MFG.)



filled by domestic production and imports, and is detailed on Figure 7 opposite.

On this basis, the market for cylinders of both high and low pressure (high pressure figures cannot be broken out) has grown from \$2,782,000 in 1961 to \$7,057,000 in 1970, a growth of 254 per cent over 10 years, or a compound growth rate of 9.8 per cent annually. Of the \$7,057,000 value of hand type fire extinguishers sold in 1970, imports amounted to \$1,843,000, for a penetration of 26 per cent. The percentage penetration of imports in this market sector appears to have been in the range of 20 - 26 per cent for the last seven years of the recorded data.

As the principal market for hand type fire extinguishers is proportional to population, (the principal markets being industry, commercial buildings, and recreational vehicles such as boats and trailers) it is not surprising that the market strength lies in the provinces of Ontario and Quebec.

This segment is expected to continue growing at the existing rate, but imports are expected to maintain their share of the total market.

Cylinders and Tanks for Liquified Petroleum Gas

The market for containers of LP gas in Canada is made up of many consumers of cylinders and tanks spread across Canada. The 15 largest consumers control approximately 85 per cent of the gas sales market, but the top six control approximately 65 per cent of the gas sales market.

These top six interests are:

- K.C. Irving
- Superior Propane
- Canadian Propane
- Quebec Propane
- Prairie Gas
- Rock Gas.

A strong regional pattern exists in the supply of propane, which, as a global market, is growing by 5 - 7 per cent annually. The Western provinces are the largest consumers of the gas, utilizing it for crop drying and domestic heating. Thus, of this total market, Ontario and Quebec account for only 25 - 30 per cent of total sales by volume. However, the primary use of propane as a domestic fuel has meant that sales are strongly oriented toward bulk, with most householders utilizing larger tanks rather than cylinders.

If the market is now examined after the exclusion of bulk sales, then a rather different pattern emerges. For cylinders only, Ontario and Quebec account for 85 per cent of the market, the principal suppliers being Superior Propane, Canadian Propane, and Quebec Propane. This sub-sector of the market is maintaining the same growth rate as the national propane market (i.e. 5-7 per cent) and industry sources put the consumption of new cylinders at 20,000 per annum at current rates.

Again, within the market for propane in cylinders, a special situation exists, whereby the market in bottled gas for trailers has

FIGURE 9

DOMESTIC MANUFACTURE OF PRESSURE AND VACUUM TANKS (LOW PRESSURE)

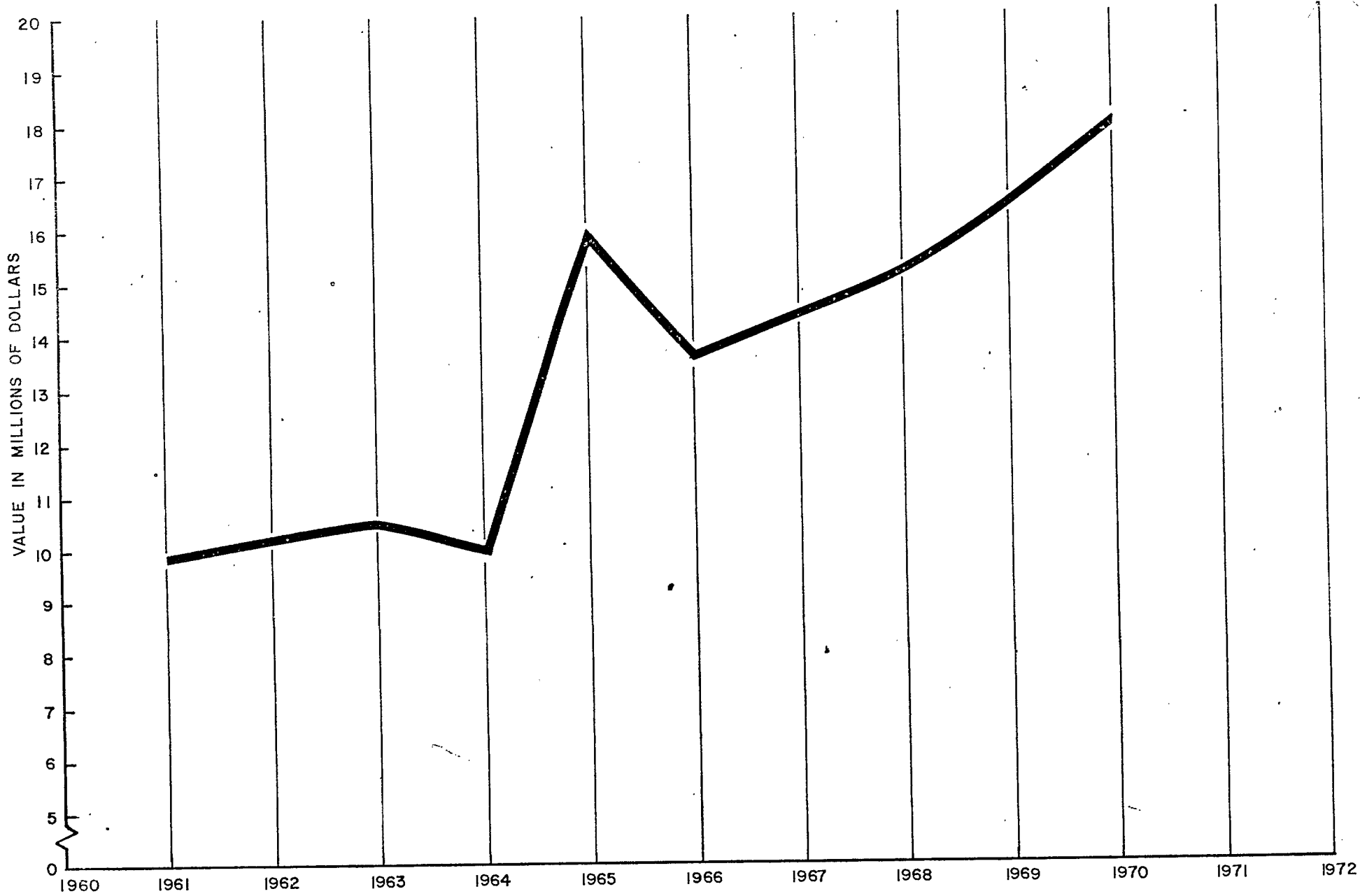


FIGURE 8

DOMESTIC MANUFACTURE OF PRESSURE AND VACUUM TANKS AND CYLINDERS
BY ALL MANUFACTURING METHODS AND INDUSTRIES
1961-1970

	1961		1962		1963		1964		1965		1966		1967		1968		1969		1970	
	Qty. Tons	Value \$000	Qty. Tons	Value \$000	Qty. Tons	Value \$000	Qty. Tons	Value \$000	Qty. Tons	Value \$000	Qty. Tons	Value \$000	Qty. Tons	Value \$000	Qty. Tons	Value \$000	Qty. Tons	Value \$000	Qty. Tons	Value \$000
41 207* <u>FABRICATED STRUCTURAL METAL INDUSTRY</u>																				
Tanks and vessels, pressure and vacuum (complete at factory) and cylinders																				
LPG tanks and other pressure and vacuum tanks and vessels	-	1,312	-	480	-	355	-	693	-	1,512	-	N/A	-	N/A	-	2,152	-	976	-	3,294
41 223* <u>BOILER AND PLATE WORKS</u>																				
LPG tanks (complete at factory)	6,030	1,816	6,585	2,495	7,977	1,997	8,510	2,353	9,331	2,770	10,827	3,543	6,961	2,350	8,423	2,843	8,653	3,554	7,385	2,817
Other pressure and vacuum	-	2,870	-	3,810	-	4,128	-	2,536	-	6,345	-	4,265	-	3,855	-	2,122	-	4,526	-	4,511
41 227* <u>METAL STAMPING, PRESSING, AND COATING</u>																				
Tanks, pressure and vacuum	-	1,100	-	633	-	1,142	-	1,058	-	1,223	-	1,195	-	3,031	-	2,483	-	2,421	-	2,137
41 228* <u>MISCELLANEOUS METAL FABRICATING INDUSTRIES</u>																				
Hand type fire extinguishers	-	2,782	-	2,767	-	2,846	-	3,258	-	3,963	-	4,525	-	5,071	-	5,584	-	4,966	-	5,214
Total	-	9,880	-	10,185	-	10,468	-	9,898	-	15,813	-	13,528	-	14,307	-	15,184	-	16,443	-	17,973

* Source: Statistics Canada publication No. and title.

grown by at least 300 per cent over the past three years, and is expected to continue this spectacular rate of growth.

EXISTING CANADIAN PRODUCTION

Details of the aggregate figures for production of pressure and vacuum tanks and cylinders are detailed numerically (Figure 8) and graphically (Figure 9) opposite. Since there is no current manufacture of high pressure cylinders in Canada, then all of the data listed must relate to low pressure or vacuum cylinders and tanks, but of course do not differentiate between market sectors.

The situation with regard to Canadian production also differs markedly for each market segment, and is described below.

Acetylene Cylinders

Within this stagnant and possibly soon to be declining sector, all Canadian production is by Canadian Cylinder of Brantford, Ontario, which is a subsidiary of Coyne Cylinder of California.

This company effectively controls supply of acetylene cylinders apparently by the world patents the parent company possesses governing the formulation of the porous mass. It is actively searching for new products and markets, and endeavouring to increase Canadian content of its cylinders.

Cylinders and Tanks for Noxious Gases

Cylinders and tanks for noxious gases are both currently imported from the United States. The market for both tanks and cylinders is tiny compared with the market for industrial gas cylinders for acetylene or high pressure gases, but it is to be expected that the advent of Marison Cylinder of Brantford in the high pressure cylinder field will permit domestic supply of the 150 lb. bottles.

For the 1 ton containers, there is no Canadian production, all tanks being imported from Columbiana Boiler Co. of America. Moreover, the demand is so small, and construction methods so specialized, that it is doubtful that Canadian production could be competitive.

Cylinders for Hand Held
Fire Extinguishers (Low Pressure)

The cylinders for hand held fire extinguishers (other than CO₂) are manufactured in Canada by the fire extinguisher manufacturers themselves, and also sold to non-manufacturing competitors in Canada.

The two manufacturers of fire extinguishers in Canada are:

- Pyrene (Canada) Ltd. - Toronto
- Flag Fire Equipment Ltd. - Toronto.

In addition, the following companies are selling fire extinguishers as importers into Canada, or as finishers of semi-finished fire extinguishers:

- Lewitt Safety Equipment - finishers
- Fyr-Fyter of Canada - finishers
- Kidde of Canada - import complete extinguishers.

It should be noted that the fire extinguisher industry appears to be tightly knit, selling incomplete cylinders to competitors, and well aware of the actions and policies of competitors within the total market.

The manufacturers of fire extinguishers appear to have adequate capacity to meet expected demand for low pressure cylinders both for their

own use and that of the competition (based on current levels of demand), and it is doubtful if current levels of imports (around 25 per cent of the total market) could be significantly reduced because the major importers bring in complete units from their parent U.S. corporations, which would not desire to decrease their exports of U.S. products.

Cylinders and Tanks
for L.P. Gas

This section of the market for low pressure cylinders has been more than adequately supplied by Engineering Products of Boucherville, Quebec.

It is doubtful that further capacity to manufacture cylinders in Canada is viable given the size of the current market, and the entry of the new company in the field.

The situation with regard to the market for tanks is somewhat different to that for cylinders. Tanks are very much larger and more expensive to transport, hence production could not be economically centred in any one location. While there are specialized manufacturers

FIGURE 11

IMPORTS OF METAL CYLINDERS AND PARTS, FOR GAS, INTO CANADA
(STATISTICS CANADA 1962-1971) BY VALUE

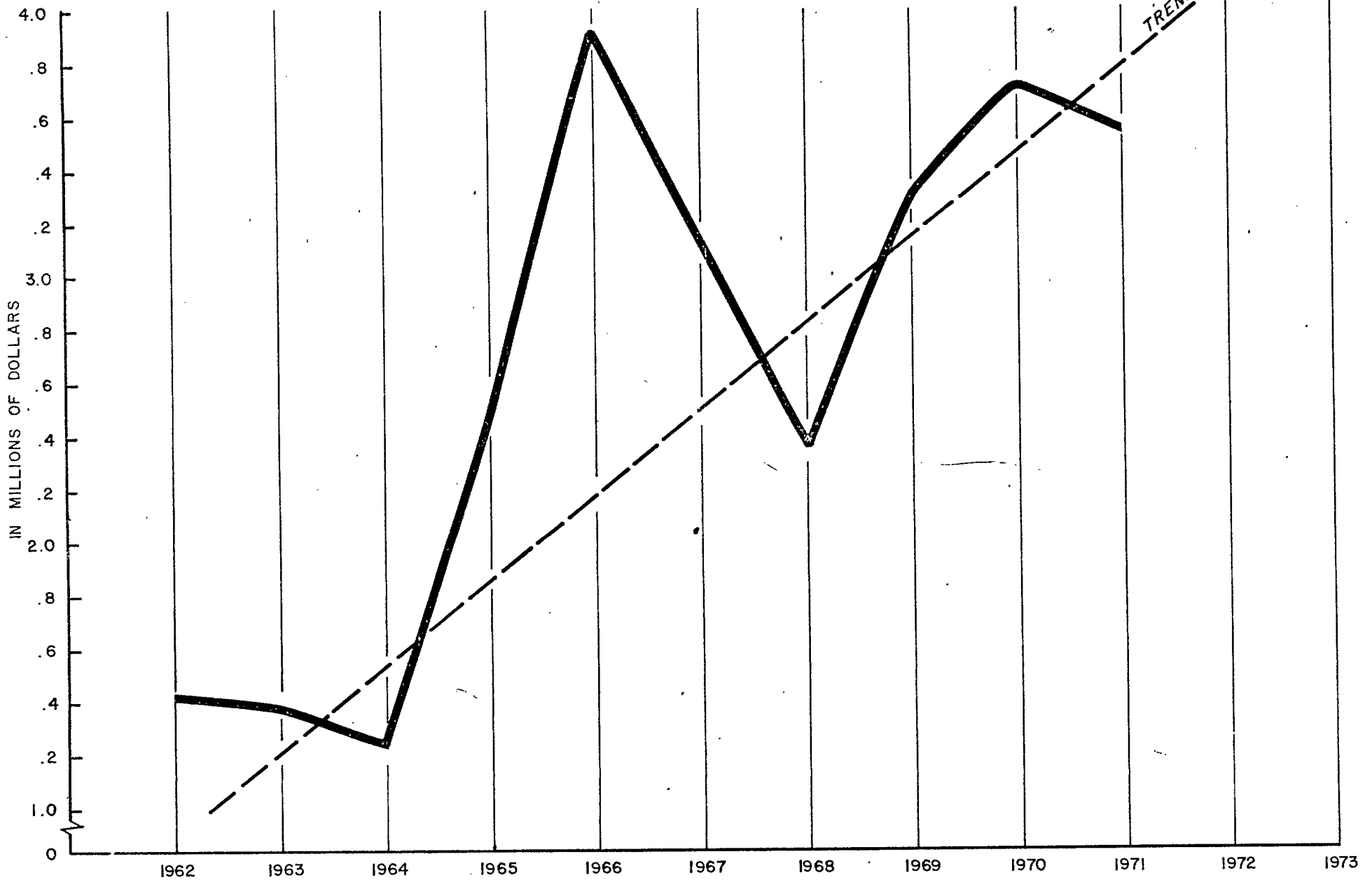


FIGURE 10

CANADIAN IMPORTS AND EXPORTS - EQUIPMENT CONTAINING GAS CYLINDERS

	1962		1963		1964		1965		1966		1967		1968		1969		1970		1971	
	Units	\$000 Value	Units	\$000 Value	Units	\$000 Value	Units	\$000 Value	Units	\$000 Value	Units	\$000 Value	Units	\$000 Value	Units	\$000 Value	Units	\$000 Value	Units	\$000 Value
<u>IMPORTS (65-017)*</u>																				
Metal Cylinders & Parts for Gas (Classification 950-24)	1,426		1,369		180,426	1,230	171,799	2,454	164,391	3,935	183,367	3,091	151,308	2,346	119,503	3,320	107,010	3,727	138,445	3,542
Hand Fire Extinguishers & Parts (Classification 720-44)	Data not recorded		Data not recorded		45,082	1,060	56,281	1,257	70,836	1,237	80,361	1,469	90,880	1,244	107,336	1,283	133,889	1,843	144,074	1,869
Fire Fighting Equipment & Parts NES (Classification 720-49)						2,375		2,981		3,665		3,201		3,501		3,980		3,867		4,893
Skin Diving Tanks & Regulators (Classification 832-80)																				1,029
TOTAL:	1,426		1,369		225,508	4,665	228,080	6,692	235,227	8,837	263,728	7,761	242,188	7,091	226,839	8,583	240,899	9,437	282,519	11,333
<u>EXPORTS (65-014)*</u>																				
Fire Fighting Equipment & Sanitation (Classification 779-19)	530		749		799		1,219		1,774		2,890		3,370		4,037		4,525		6,226	
Shipping Containers & Parts, Metal (Classification 950-29)					TOO BROAD A CLASSIFICATION TO BE USEFUL															

* Statistics Canada Publication

of tanks, in general, tanks are much more easily manufactured or fabricated than cylinders and there is more competition at the manufacturing level. The custom manufacturing level can be filled more than adequately by process engineers, custom fabricating shops, or even local welding shops.

IMPORTS

Imports of equipment containing gas cylinders into Canada, both high and low pressure are detailed numerically (Figure 10), and graphically (Figure 11) opposite, with the apparent trend in sales denoted in Figure 11. Although imports appear fairly substantial, amounting to 34 per cent of the total market by value, nevertheless, if the value of fire extinguishers is removed from consideration of domestic product and imports, imported gas cylinders account for only 26 per cent of the national market. However, these figures also include high pressure cylinders to the approximate value of \$2.5 million. If these in turn are removed from the figures, then the share of the total market held by imports decreases to about 13.5 per cent.

The data relating to U.S. exports to Canada of compressed gas cylinders and similar equipment are also detailed in Figure 12, opposite. While the figures of U.S. exports and Canadian imports roughly correspond on a value basis, they do not correspond on a quantity basis. Statistics Canada have checked this discrepancy with the U.S. Department of Commerce in Washington, and inform us that the discrepancy probably arises from two coincident differences of product definition:

1. U.S. exports include steel shells utilized in Canada as a raw material in the manufacture of finished cylinders, primarily by Canadian Cylinder. These shells are considered a raw material by Canada Customs, and are included with semi-finished steel imports, not pressure cylinders and parts.
2. U.S. exports include self-contained propane blow torches and tanks, which Statistics Canada does not include in pressure cylinders and parts, and which are not considered a part of this study. Thus, very large numbers of relatively cheap cylinders are included in U.S. export statistics and do not appear in Canadian imports.

In general, the import of cylinders into Canada should decline within the next two years as the high pressure cylinder manufacturing facility of Marison Cylinder Co., and the low pressure cylinder manufacturing facility of Western Gas and Oil become known and sales increase.

EXPORTS

Details of Canadian exports are unobtainable because they are included within very broad product definitions and are impossible to separate, but in general they are felt to be extremely small in terms of value, and so are not a significant factor within the study.

CONSUMPTION GROWTH

While it is possible to derive an overall figure of consumption growth for the entire industry based on projections of Figure 3, it is felt that the diverse nature of the various segments and the differing

growth rates make such projections largely futile in assessing investment opportunities, and it is of more use to examine the individual segments separately for rates of growth and production gaps. By segment, therefore, the growth is expected as follows:

Acetylene Cylinders

No growth is expected over the medium to long-term which cannot be adequately handled by existing Canadian production.

Low Pressure Cylinders
and Tanks for Noxious Gases

Growth is expected in 1 ton chlorine containers only (11-12 per cent annually) with no growth expected in 150 lb. cylinders. However, the annual demand is so small that it is not expected to be sufficient to justify a production facility at least for the next 10 years.

Low Pressure Cylinders
for Fire Extinguishers

Existing capacity to manufacture cylinders for fire extinguishers appears more than adequate to meet anticipated demand over the near future, given that imports continue at present levels. Demand is expected to continue growing at close to 10 per cent a year, but importers are expected to maintain or even increase their market share because the larger volume throughput of American producers permits economies of scale which are reflected in export prices.

L.P. Gas Cylinders
and Tanks

L.P. gas cylinders and tanks are expected to continue growing

at 5 - 7 per cent per annum, and Canadian supply of cylinders would appear adequate. The supply of tanks, being more transportation sensitive, might present an opportunity for an entrepreneur in the Maritime Provinces or B.C., but the Maritime facility would meet competition from the major force in the field, located in Boucherville. Further, detailed investigation of the field would be advised, particularly the size of the regional markets and competition in the proposed area, but Ontario, Quebec, and the Prairies appear to have adequate supply of manufacturing capability.

CONCLUSION

From the foregoing, it would appear obvious that little opportunity exists for new manufacturing facilities in Canada, with the possible exception of bulk storage tanks for L.P. gas in either the Maritime market or the B.C. market, and further, detailed investigation of the segment is advised on the part of the entrepreneur. The only other possibility of benefit to the Canadian economy would appear to be the reduction of imported raw materials and finished goods used in the manufacture of acetylene cylinders and fire extinguishers, by the imposition of higher tariffs or less stringent enforcement of construction standards by the Canadian Transportation Commission, particularly in regard to acetylene cylinders.

IV - COSTSMANUFACTURING COSTS

Manufacturing costs were not obtainable for all of the market segments here considered, and vary depending on the method of manufacture, form of raw material purchases (whether finished or semi-finished articles, and whether or not imported), and the manufacturing standards imposed by regulatory bodies. By segment however, the figures are approximately as follows:

Acetylene Cylinders

Costs based on imported, semi-finished shells which are subsequently finished in Canada:

Raw materials (including duty and transport)	-	66%
Labour	-	13
Overhead and profit	-	<u>21</u>
Ex-works cost		100%

Low Pressure Cylinders
for Noxious Gases

Low pressure cylinders for noxious gases based on U.S. costs for the manufacture of high pressure cylinders by the billet piercing method:

Raw Material	-	40%
Labour	-	20
Overhead and profit	-	<u>40</u>
Ex-works cost	-	100%

Low Pressure Cylinders
for Fire Extinguishers

Based on Canadian raw materials and costs:

Raw Material	-	65%
Labour	-	10
Overhead and profit	- /	<u>25</u>
Ex-works cost	-	100%

TARIFFS

Exports

Exports are not significant for the market as a whole, or for any segment within it. Such exports as exist would be largely to the United States, and attract duty as follows:

Empty metal pressure cylinders - 5% - Item 640-1

Stainless steel cylinders - 7½%

Imports

All low pressure cylinders, of steel or aluminum:

- | | |
|--|-------------------------------------|
| - Most favoured nation
(including U.S.A.) | 17-1/2% - Item 446-12-1
steel |
| | 17-1/2% - Item 354-00-1
aluminum |
| - From Britain | Free - Item 446-12-1
steel |
| | 15% - Item 354-000-1
aluminum |

Steel shells used in the manufacture of pressure cylinders by Canadian subsidiaries of foreign companies attract an advance on the value of shells of 10 per cent before calculating the duty payable on the imported goods. Thus, if an American company purchases shells for a Canadian subsidiary at \$1 each and ships them across the border, duty is applied on a price of $\$1. + 10\% = \1.10 .

This "advance" is applied because the sales price of the finished product (acetylene cylinders as an example) in Canada would normally have a higher profit margin than if the shells had been purchased in Canada. To partially offset the increased profit to the Canadian subsidiary by virtue of less tariff payable on the semi-finished raw material, the duty base is increased by a specific percentage dependent upon the American content of the finished product. This "advance" is seen as a specific inducement to Canadian subsidiaries of foreign corporations to increase Canadian content of their end products.

V - LOCATIONAL FACTORSTRANSPORTATION COSTS AS
A LOCATIONAL FACTOR

Transportation cost is the determining factor in the location of a manufacturing facility for gas cylinders or tanks, whether high or low pressure.

Since the consumption of cylinders for noxious gases, acetylene, L.P. gases, and fire extinguishers is all concentrated in the Provinces of Quebec or Ontario, particularly on the Montreal-Windsor axis, then this is the area in which cylinder manufacturers should logically locate.

If anything, transport cost is even more critical for the manufacturing of tanks as opposed to cylinders, and, because consumption of tanks is more widely dispersed for tanks than it is for cylinders, this represents possibly the only avenue for an entrepreneur wishing to enter this market now. The suggested areas of endeavour would in all probability be British Columbia or the Maritimes, and the suggested product could be L.P. gas tanks. Further investigation of the regional market in this sector is urged before any investor is encouraged to proceed.

LINKAGE PATTERNSUse of End Product

As almost every manufacturer within the field is continuously searching for allied new products, or new markets, it is doubtful that

any possibilities that are financially feasible remain unexplored. Particularly with cylinders for fire extinguishers, three separate Canadian manufacturers have ceased production and reverted to imports over the past 5 - 7 years, namely General Fire Extinguisher, La France, and Kidde, and it is highly doubtful that these facilities were closed without an energetic search for new products or markets.

VI - CONSTRAINTS AND STRENGTHS

CONSTRAINTS

The fact that consumption of cylinders for all uses is largely confined to Ontario and Quebec, allied to the high transport cost sensitivity of the product militates against the location of a cylinder manufacturing facility outside one of these two provinces. In addition, high volume producers based in the United States represent severe price competition, and to compete effectively a manufacturer would need high volume, necessitating significant levels of capital expenditure.

Manufacture of tanks seems a more promising area of endeavour because high transport costs weigh heavily against suppliers outside a provincial region, but the highly fragmented nature of the supply industry makes the assessment of market size by region extremely difficult, since virtually any welding shop can make custom tanks to order. Therefore, quantification of the competition as a factor determining the size of facility and throughput would be extremely difficult and relatively costly.

STRENGTHS

All sectors of the market are characterized by relatively few major consumers, so that marketing and sales efforts need not be unduly expensive. Once a product has achieved acceptability within the market, moreover, a reasonable size production run in the Canadian context

could be achieved even if only one major consumer buys the product. However, whether or not a reasonable size production run in the Canadian context is sufficient justification for a new cylinder manufacturing facility is doubtful.

