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**PROPANE MARKET STUDY**  
**SUMMARY REPORT**

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*Prepared For*  
**Propane Gas Association of Canada**

*Prepared By*

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INC.

*Buenos Aires ~ Calgary ~ Dubai ~ Houston  
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## I. INTRODUCTION

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Purvin & Gertz was engaged by the Propane Gas Association of Canada (PGAC) to provide an update to Purvin & Gertz' Propane Market Study report which was prepared for the PGAC in April 2006 (C-2568). The report is an analysis of the Canadian Propane market. The data in the report will be used in communications prepared by the PGAC for the benefit of members.

This report has been prepared for the sole benefit of the client. Neither the report nor any part of the report shall be provided to third parties without the written consent of Purvin & Gertz. Any third party in possession of the report may not rely upon its conclusions without the written consent of Purvin & Gertz. Possession of the report does not carry with it the right of publication.

Some of the information on which this report is based has been provided by others including the client. Purvin & Gertz has utilized such information without verification unless specifically noted otherwise. Purvin & Gertz accepts no liability for errors or inaccuracies in information provided by others.

Purvin & Gertz conducted this analysis and prepared this report utilizing reasonable care and skill in applying methods of analysis consistent with normal industry practice. All results are based on information available at the time of review. Changes in factors upon which the review is based could affect the results. Forecasts are inherently uncertain because of events or combinations of events that cannot reasonably be foreseen including the actions of government, individuals, third parties and competitors. **NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.**

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## II. EXECUTIVE SUMMARY

Purvin & Gertz was engaged by the Propane Gas Association of Canada to prepare an analysis of the Canadian propane markets including supply, demand and economic indicators.

Canadian propane supply and demand results are shown in Table II-1.

	2001	2002	2003	2004	2005	2006E
<b>Supply</b>						
Gas Plant	8,625,192	10,197,510	9,699,175	9,515,351	9,490,163	9,583,353
Refinery	2,061,981	2,023,088	2,006,490	1,570,928	1,400,428	1,253,018
Imports	166,026	110,671	105,021	124,554	92,500	165,840
Inventory Adjustment	-529,347	694,496	1,122,376	50,351	126,432	57,319
<b>Total</b>	<b>10,323,852</b>	<b>13,025,765</b>	<b>12,933,062</b>	<b>11,261,184</b>	<b>11,109,523</b>	<b>11,059,530</b>
<b>Demand</b>						
Wholesale	396,690	557,606	636,693	484,747	720,906	724,389
Retail	1,713,988	2,441,023	2,769,011	1,990,787	2,956,709	3,026,362
Exports	8,213,174	10,027,137	9,527,358	8,785,650	7,431,909	7,308,779
<b>Total</b>	<b>10,323,852</b>	<b>13,025,765</b>	<b>12,933,062</b>	<b>11,261,184</b>	<b>11,109,523</b>	<b>11,059,530</b>

## DATA SOURCES

The supply and disposition numbers in this report are based on a variety of sources including statistics published by the National Energy Board (NEB), Natural Resources Canada (NRCan), Statistics Canada, the Alberta Energy and Utilities Board (AEUB), the British Columbia Department of Energy and Mines, the Saskatchewan Department of Mineral Resources, industry surveys and other sources.

## INDUSTRY INDICATORS

Purvin & Gertz estimates that the total value of the Canadian propane industry is approximately \$3.8 billion per year. With an overall industry multiplier of approximately 2.5 the total economic value of the propane industry in Canada is approximately \$9.6 billion per year.

Purvin & Gertz estimates that the total direct employment in the propane industry in Canada is approximately 8,200 and the total indirect employment in the propane industry in Canada is approximately 20,000.

Purvin & Gertz estimates that the total payments of royalties, fees, income and other taxes was approximately \$875 million in 2006.

## **FUTURE WORK**

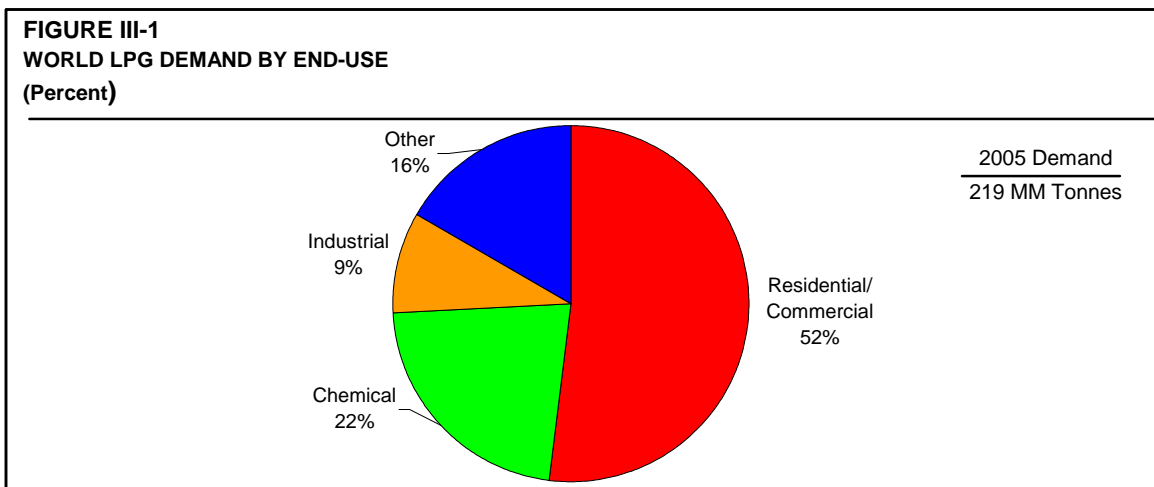
This study has a degree of uncertainty due to the lack of publicly available data and inconsistent industry reporting. A more thorough analysis, using a direct survey with all industry participants, from suppliers to end users, may provide more accurate results.

### III. MARKET OVERVIEW

#### WORLD AND NORTH AMERICAN ENERGY CONSUMPTION

Throughout much of the world, propane is produced and consumed as part of a Liquefied Petroleum Gas (LPG) mixture consisting primarily of propane and butane. Utilization of LPG as fuel in residential and commercial markets has been rising fairly rapidly in many developing countries as access to LPG is expanded and markets are liberalized.

About 74% of world LPG consumption is concentrated in two end-use sectors — the residential/commercial and the chemical markets. The residential/commercial sector is expanding quickly in developing markets and the chemical sector is undergoing dramatic growth, especially in the Middle East.



Worldwide, propane is a relatively small component of the total energy supply spectrum. Purvin & Gertz estimates that propane's share of total energy demand in Canada is in the 1.25% to 1.5% range.

#### MARKET OUTLOOK

The vast majority of Canada's propane production results from natural gas processing. Propane production in Canada has declined slightly over the 2003 to 2006 period while natural gas production has remained relatively flat. Gas oriented drilling rates have increased dramatically in recent years throughout North America with no significant increase in overall production. Many forecasts call for declining conventional natural gas production as a result of

drilling rates being unable to overcome field production declines. This would result in declining propane production.

Canadian propane markets are expected to tighten with declining gas production and steady markets in most of the traditional propane demand areas. Petrochemical usage is expected to increase and exports should decrease.

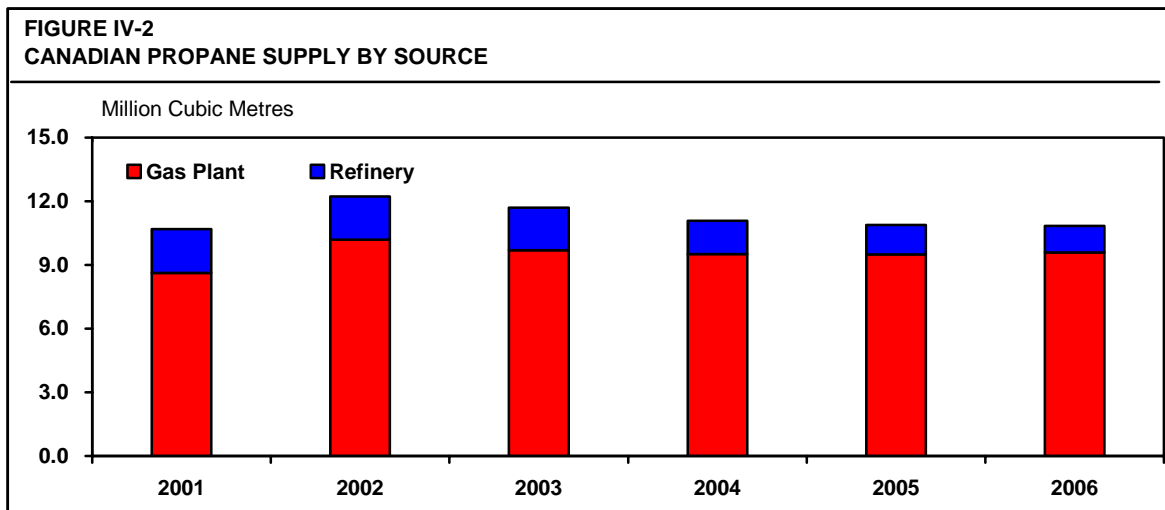
## IV. PROPANE SUPPLY AND DEMAND

There is a well-developed propane infrastructure in Canada. Propane supply is dominated by Alberta gas plant production, from which it is moved by truck, rail and pipeline throughout the province, across Canada, and for export to the United States. Significant volumes are also produced in Central and Eastern Canadian refineries. Propane demand is seen across all the provinces, with consumption dominated by conventional and industrial customers.

### PROPANE SUPPLY

Over 80% of the propane available in Canada is recovered by gas plants mostly in Alberta. The balance of Canadian propane supply is recovered primarily in refineries.

Canadian refinery propane production has been relatively stable over the last three years, but has remained at below 15 percent of total supply. Total Propane supply for the years 2001 to 2006 is shown in Figure IV-2. The supply by province is shown in Table IV-3.



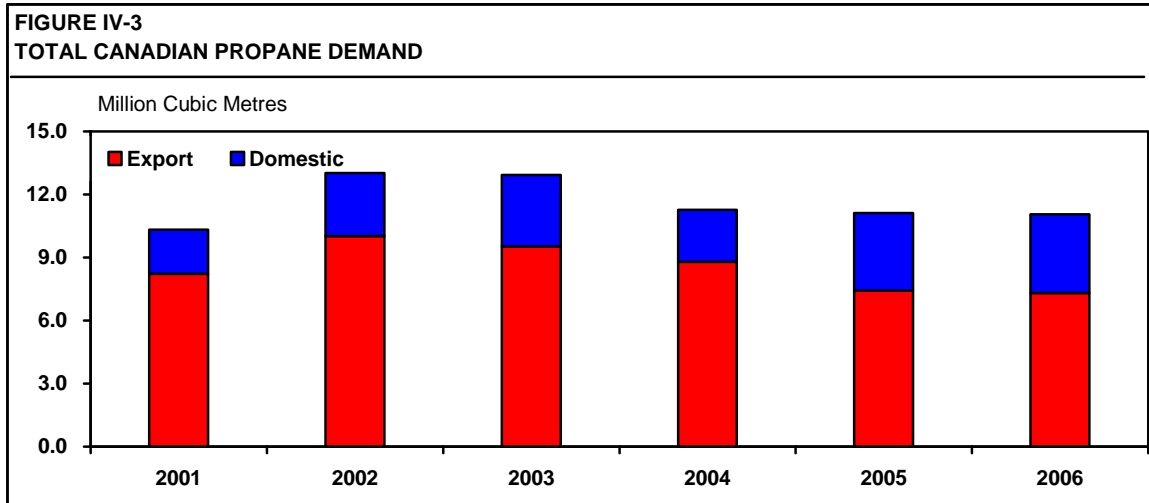
**TABLE IV-3**  
**CANADIAN PROPANE SUPPLY BY SOURCE AND PROVINCE**  
**(Cubic Metres)**

	Purvin & Gertz					
	2001	2002	2003	2004	2005	2006
<b>Gas Plant<sup>c</sup></b>						
British Columbia	457,783	364,752	360,742	353,554	354,535	360,201
Alberta	7,851,656	9,469,513	9,003,966	8,840,598	8,779,929	8,885,362
Saskatchewan	128,253	119,546	130,197	132,800	131,700	133,175
Ontario	0	0	0	0	0	0
Quebec	0	0	0	0	0	0
New Brunswick	0	0	0	0	0	0
Nova Scotia	187,500	243,700	204,270	188,400	224,000	204,616
Newfoundland	0	0	0	0	0	0
<b>Total</b>	<b>8,625,192</b>	<b>10,197,510</b>	<b>9,699,175</b>	<b>9,515,351</b>	<b>9,490,163</b>	<b>9,583,353</b>
<b>Refinery<sup>2</sup></b>						
British Columbia	53,450	48,001	46,140	48,965	42,581	46,658
Alberta	497,153	476,852	477,314	436,701	414,859	348,036
Saskatchewan	74,464	70,455	80,105	69,315	74,286	85,517
Ontario	500,190	386,490	399,285	407,749	272,415	224,674
Quebec	363,828	399,778	452,308	428,152	432,215	373,193
New Brunswick	484,212	560,906	475,888	105,590	99,064	92,717
Nova Scotia	60,255	62,083	55,519	51,933	39,658	51,405
Newfoundland	28,429	18,523	19,931	22,523	25,350	30,818
<b>Total</b>	<b>2,061,981</b>	<b>2,023,088</b>	<b>2,006,490</b>	<b>1,570,928</b>	<b>1,400,428</b>	<b>1,253,018</b>
<b>Imports</b>						
British Columbia	49,060	40,628	47,282	44,693	33,191	59,507
Alberta	9,543	10,778	1,012	6,961	5,169	9,268
Saskatchewan	2,010	293	3,967	2,046	1,519	2,724
Manitoba	277	660	228	380	282	506
Ontario	54,456	47,404	49,663	49,441	36,718	65,830
Quebec	4,239	3,995	1,499	3,176	2,359	4,229
New Brunswick	46,440	6,915	1,371	17,857	13,262	23,776
<b>Total</b>	<b>166,026</b>	<b>110,671</b>	<b>105,021</b>	<b>124,554</b>	<b>92,500</b>	<b>165,840</b>
<b>Provincial Totals</b>						
British Columbia	560,293	453,380	454,164	447,212	430,307	466,365
Alberta	8,358,352	9,957,142	9,482,291	9,284,259	9,199,957	9,242,666
Saskatchewan	204,727	190,293	214,269	204,161	207,505	221,416
Manitoba	277	660	228	380	282	506
Ontario	554,646	433,894	448,948	457,190	309,133	290,504
Quebec	368,067	403,773	453,807	431,328	434,574	377,422
New Brunswick	530,652	567,821	477,259	123,447	112,326	116,493
Nova Scotia	247,755	305,783	259,789	240,333	263,658	256,020
Newfoundland	28,429	18,523	19,931	22,523	25,350	30,818
<b>Canadian Total</b>	<b>10,853,199</b>	<b>12,331,269</b>	<b>11,810,686</b>	<b>11,210,833</b>	<b>10,983,091</b>	<b>11,002,211</b>

**Notes:** 1) National Energy Board 2006 numbers are year-to-date  
2) National Energy Board gas plant numbers include purchases from "Non-reporting companies"  
3) 2006 refinery numbers have been annualized

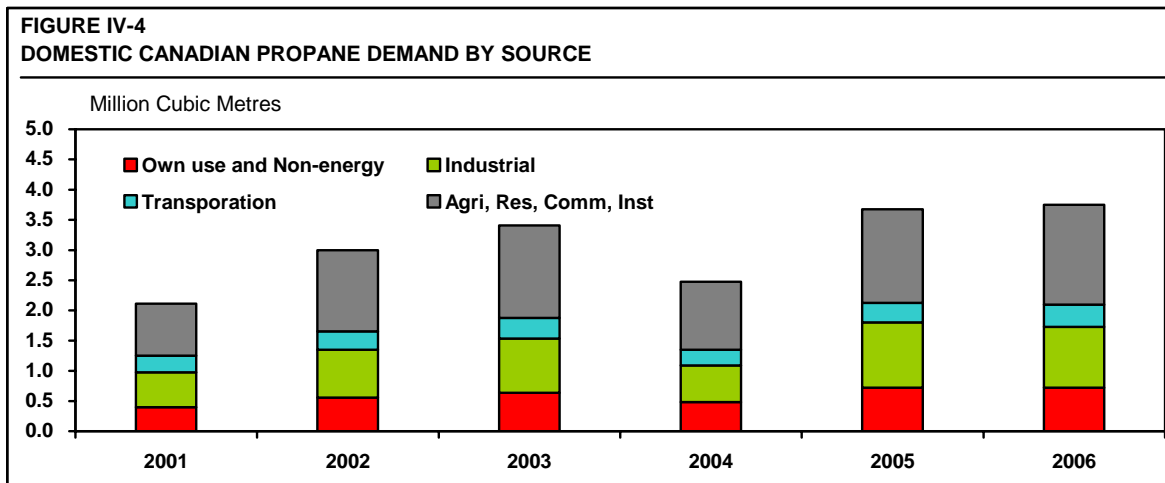
## PROPANE DEMAND

Propane demand is shown in Figures IV-3 and IV-4 and Tables IV-4.



## EXPORTS

By far the most significant demand segment is exports. Exports account for 2/3 of the overall market with virtually all of the exports destined for the United States. In the U.S., propane is consumed in a number of markets including space heating, crop drying, and as a petrochemical feedstock. The U.S. Gulf Coast centered petrochemical segment drives the market price for propane across North America.



**TABLE IV-4**  
**CANADIAN PROPANE DEMAND BY SOURCE AND PROVINCE**  
**(Cubic Metres)**

	Purvin & Gertz					
	2001	2002	2003	2004	2005	2006
<b>Wholesale Demand</b>						
British Columbia	22,125	26,895	33,123	23,808	32,955	27,497
Alberta	23,083	29,408	35,323	20,580	30,166	33,264
Saskatchewan	33,772	47,465	54,201	38,121	59,634	55,409
Manitoba	0	0	0	0	0	0
Ontario	100,073	193,072	190,378	170,563	262,787	281,401
Quebec	112,392	184,197	195,277	157,897	249,630	237,334
New Brunswick	89,233	55,871	103,720	53,741	56,092	56,494
Nova Scotia	16,011	20,697	24,671	20,037	29,642	32,989
Newfoundland	0	0	0	0	0	0
<b>Total</b>	<b>396,690</b>	<b>557,606</b>	<b>636,693</b>	<b>484,747</b>	<b>720,906</b>	<b>724,389</b>
<b>Retail Demand</b>						
British Columbia	184,625	224,429	276,400	198,670	274,995	229,454
Alberta	749,645	955,070	1,147,160	668,345	979,681	1,080,293
Saskatchewan	53,669	75,430	86,134	60,582	94,768	88,055
Manitoba	78,632	96,191	118,063	97,743	131,159	99,482
Ontario	350,584	676,387	666,948	597,532	920,618	985,829
Quebec	176,123	288,644	306,007	247,431	391,180	371,912
New Brunswick	44,626	27,942	51,871	26,876	28,052	28,253
Nova Scotia	36,541	47,234	56,304	45,728	67,648	75,287
Prince Edward Island	8,330	10,828	12,869	12,065	16,904	13,479
Newfoundland	12,441	15,109	18,618	14,443	21,793	31,500
Territories	18,772	23,760	28,638	21,372	29,909	22,818
<b>Total</b>	<b>1,713,988</b>	<b>2,441,023</b>	<b>2,769,011</b>	<b>1,990,787</b>	<b>2,956,709</b>	<b>3,026,362</b>
<b>Exports</b>						
British Columbia	87,655	72,183	52,950	67,326	56,952	56,008
Alberta	5,161,564	6,370,903	5,369,682	5,347,815	4,523,795	4,448,845
Saskatchewan	208,616	162,242	109,324	151,929	128,519	126,389
Manitoba	136,065	166,129	181,070	152,904	129,344	127,201
Ontario	2,462,262	3,117,142	3,623,446	2,911,768	2,463,107	2,422,299
Quebec	106,928	84,310	112,056	95,962	81,175	79,831
New Brunswick	20,457	20,781	23,926	20,618	17,441	17,152
Nova Scotia	28,973	33,039	54,622	36,903	31,217	30,700
Prince Edward Island	81	215	107	128	108	106
Newfoundland	100	100	59	82	69	68
Territories	474	93	117	216	183	180
<b>Total</b>	<b>8,213,174</b>	<b>10,027,137</b>	<b>9,527,358</b>	<b>8,785,650</b>	<b>7,431,909</b>	<b>7,308,779</b>
<b>Provincial Totals</b>						
British Columbia	206,750	251,324	309,523	222,478	307,950	256,951
Alberta	772,728	984,478	1,182,484	688,925	1,009,848	1,113,558
Saskatchewan	87,441	122,895	140,335	98,703	154,402	143,464
Manitoba	78,632	96,191	118,063	97,743	131,159	99,482
Ontario	450,657	869,459	857,326	768,096	1,183,405	1,267,230
Quebec	288,516	472,840	501,284	405,329	640,810	609,246
New Brunswick	133,859	83,813	155,590	80,617	84,144	84,747
Nova Scotia	52,552	67,931	80,975	65,765	97,290	108,276
Prince Edward Island	8,330	10,828	12,869	12,065	16,904	13,479
Newfoundland	12,441	15,109	18,618	14,443	21,793	31,500
Territories	18,772	23,760	28,638	21,372	29,909	22,818
<b>Total Canadian Domestic Demand</b>	<b>2,110,678</b>	<b>2,998,628</b>	<b>3,405,704</b>	<b>2,475,534</b>	<b>3,677,614</b>	<b>3,750,751</b>
<b>Total Canadian Demand</b>	<b>10,323,852</b>	<b>13,025,765</b>	<b>12,933,062</b>	<b>11,261,184</b>	<b>11,109,523</b>	<b>11,059,530</b>

**Note:** 1) National Energy Board 2006 numbers are annualized from year-to-date data

## DEMAND CATEGORIES

In general, wholesale demand is comprised of large industrial consumer demand. These include refineries (refinery feedstocks) and petrochemical facilities (non-energy use). Retail demand is almost entirely fuel use in the various industries identified. Purvin & Gertz divides the retail market for propane into conventional markets and auto propane.

### CONVENTIONAL MARKETS

A major use of propane in Canada is for residential and commercial consumption as a heating and cooking fuel. There is also industrial demand including paving applications, construction heating, heavy industrial use, food processing, and agricultural demand for crop drying. Annual conventional demand for propane grew significantly over the 2001 to 2006 period.

Where natural gas is available, propane is not generally cost competitive on a thermal basis with gas supplies by pipeline. Propane is widely used as a fuel in sparsely populated areas, which are not connected to the natural gas distribution system. In these areas, the alternative energy sources are propane, fuel oil, and electricity. Many customers in these areas have opted for propane due to its convenience and clean burning characteristics and costs.

### ENGINE FUEL/AUTO PROPANE

Propane use in transportation was promoted for several years by the Government of Canada, by some provincial governments (particularly Ontario), and by propane distributors. Initially, provincial and federal governments viewed the concept as a means of reducing crude oil imports by the substitution of domestically produced alternative liquid fuels. One consequence of Canada's propane surplus is that incentives to increase domestic propane use tend to be viewed by governments as being consistent with public policy. To a significant extent, past efforts to increase propane consumption were successful. Fleet vehicles currently represent the major market for propane as a transportation fuel, and propane is now widely available at a broad network of retail outlets across the country. Some of the more significant applications are taxis, delivery and service vehicles, and school buses.

In the future, environmental or clean air initiatives may provide some renewed stimulus for auto propane in Canada. However, the development of more complicated, fuel-efficient gasoline engines increases the conversion cost. Market demand for vehicle conversion to propane has dropped as a result of increased prices and conversion costs.

It is difficult to find reliable data on auto propane demand in North America. Purvin & Gertz estimates that the number of propane fueled vehicles in Canada is probably in the 50,000 to 60,000 range. A considerable amount of further investigation would be required to improve this estimate.

The PGAC reports 2,114 propane refueling stations in Canada. The distribution of these stations across the country is shown in Table IV-6. Purvin & Gertz estimates that the total number of automotive refueling stations in Canada is probably in the 2,200 to 2,500 range.

	<u>NL</u>	<u>PE</u>	<u>NS</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NWT</u>	<u>TOTAL</u>
<b>PGAC Distribution</b>	8	11	37	20	266	273	151	256	238	821	33	2,114
<b>PGAC %</b>	0.38%	0.52%	1.75%	0.95%	12.58%	12.91%	7.14%	12.11%	11.26%	38.84%	1.56%	100.00%

## V. INDUSTRY ECONOMIC INDICATORS

Industrial activities cause direct impacts or first round effects on the economy from expenditures such as salaries as well as investments such as construction and capitalized goods and services. Indirect impacts are caused by the impact of these expenditures on other firms to satisfy this increase in demand. Consumer induced or spin-off impacts occur when consumer spending changes in response to an increase in income taken after taxes and savings.

### MULTIPLIERS

Multipliers are summary statistics of the impact of the contribution of a specific industry. Multipliers vary in magnitude depending on the extent of "leakages" such as imports. They are often used to predict the economic impacts of similar activity of different magnitudes. Purvin & Gertz estimates that the propane industry has a multiplier of 2.5. Tables V-1A and V-2A present Purvin & Gertz' estimate of total economic impact by province.

	2001	2002	2003	2004	2005	2006
British Columbia	149,136,020	110,979,485	174,032,491	153,613,453	191,816,129	182,372,085
Alberta	1,701,554,767	1,528,714,504	2,162,770,588	2,138,626,307	2,710,747,875	2,814,328,406
Saskatchewan	53,219,863	55,836,130	69,488,830	63,214,261	84,314,976	86,884,752
Manitoba	26,189,235	31,406,581	38,519,117	34,232,546	44,252,190	36,126,166
Ontario	124,137,311	217,774,383	207,006,192	188,217,842	260,433,024	312,206,177
Quebec	82,555,740	132,299,259	135,705,407	111,699,777	159,678,306	157,614,151
New Brunswick	25,069,024	15,329,669	29,895,848	19,948,338	19,735,417	23,531,056
Nova Scotia	77,005,155	87,392,816	115,018,030	116,159,032	155,502,321	138,599,939
Prince Edward Island	3,793,785	5,135,171	6,542,054	6,733,812	8,577,129	6,640,195
Newfoundland	5,787,832	8,053,654	8,914,878	7,198,862	9,798,111	15,950,696
Territories	7,501,403	9,110,038	12,691,497	10,262,176	14,887,359	10,921,586
<b>Total Canada</b>	<b>2,255,950,135</b>	<b>2,202,031,689</b>	<b>2,960,584,931</b>	<b>2,849,906,406</b>	<b>3,659,742,838</b>	<b>3,785,175,209</b>

	2001	2002	2003	2004	2005	2006
British Columbia	378,375,986	284,800,141	450,046,200	392,878,400	492,228,414	466,258,337
Alberta	4,165,240,889	3,667,288,009	5,329,149,997	5,222,206,312	6,719,976,800	6,984,943,624
Saskatchewan	139,322,331	149,737,140	184,655,191	165,258,010	223,308,733	230,029,609
Manitoba	72,461,210	87,445,667	105,927,651	93,989,073	120,336,751	98,539,320
Ontario	358,314,681	630,382,577	595,408,109	541,107,006	743,695,509	893,644,863
Quebec	231,287,144	372,583,189	378,917,528	311,472,206	441,418,897	436,237,100
New Brunswick	70,712,860	43,446,669	84,364,179	56,553,612	55,697,398	66,634,909
Nova Scotia	195,294,741	221,475,105	295,015,774	297,699,493	398,700,650	356,043,970
Prince Edward Island	10,939,060	14,851,711	18,808,411	19,344,914	24,527,760	19,016,337
Newfoundland	15,917,563	22,299,794	24,356,739	19,634,427	26,447,971	43,197,514
Territories	21,629,664	26,268,030	36,594,865	29,590,122	42,926,447	31,491,474
<b>Total Canada</b>	<b>5,659,496,129</b>	<b>5,520,578,032</b>	<b>7,503,244,643</b>	<b>7,149,733,574</b>	<b>9,289,265,330</b>	<b>9,626,037,057</b>

## EMPLOYMENT

Employment estimates for the propane industry in Canada vary. Purvin & Gertz estimates that the total direct employment in the propane industry in Canada is approximately 8,200 and the total indirect employment in the propane industry in Canada is approximately 20,000. The employment breakdown by province is presented in Table V-3.

	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>
BC/Territories	376	382	467	474
Alberta	3628	3682	4500	4568
Saskatchewan/Manitoba	305	310	379	385
Ontario	902	916	1119	1136
Quebec	753	764	934	948
Atlantic Provinces	<u>535</u>	<u>543</u>	<u>664</u>	<u>674</u>
Total	6500	6598	8063	8184

## TAXES & ROYALTIES

The industry's activities also have positive impacts on governmental revenues. The industry contributes to government revenues through income taxes and royalties. Furthermore, property taxes and other indirect taxes should be taken into account. There is, of course, an additional fiscal impact from other direct and indirect activities generated by the industry's activities. Purvin & Gertz estimates that the total payments of royalties, fees, income and other taxes has averaged over \$675 million per year for the period from 2003 through 2006. The breakdown by province is presented in Table V-4.

**TABLE V-4  
CANADIAN PROPANE INDUSTRY TAXES & ROYALTIES**

(\$ millions)	2003	2004	2005	2006
<b>Taxes</b>				
Territories	\$1.0	\$1.2	\$1.7	\$1.3
BC	\$14.5	\$15.8	\$23.3	\$19.9
Alberta	\$26.6	\$23.5	\$40.1	\$45.4
Saskatchewan	\$2.6	\$2.8	\$4.7	\$4.6
Manitoba	\$6.6	\$8.7	\$12.4	\$9.8
Ontario	\$17.4	\$23.5	\$37.6	\$43.0
Quebec	\$19.2	\$23.6	\$37.6	\$36.6
New Brunswick	\$3.6	\$3.3	\$3.5	\$4.0
Nova Scotia	\$5.2	\$7.0	\$10.3	\$10.8
PEI	\$0.6	\$0.9	\$1.2	\$0.9
Newfoundland	\$1.6	\$2.0	\$2.9	\$4.7
Total Taxes	\$98.9	\$112.2	\$175.4	\$181.0
<b>Royalties</b>				
Alberta	\$401.9	\$392.7	\$492.8	\$618.4
BC	\$20.1	\$19.6	\$24.6	\$30.9
Saskatchewan	\$8.4	\$8.2	\$10.3	\$13.0
Nova Scotia	\$20.7	\$20.2	\$25.3	\$31.8
Total Royalties	\$451.1	\$440.8	\$553.1	\$694.1