PRODUCER, RETAILER AND CONSUMER PERSPECTIVES ON CANADA'S ENERGY LABELING PROGRAM FOR MAJOR APPLIANCES

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The views presented in this paper are those of the authors and do not necessarily reflect the views or positions of the Department of C.C.A.

PREFACE

For the past year and a half the authors have devoted considerable effort to monitoring and analyzing the manner in which producers, retailers and consumers have reacted to Canada's new ENERGUIDE energy labeling program for major appliances. The present report presents results of primary and secondary data collections on producers and retailers, and a natonal consumer survey of recent appliance purchasers. It represents a broadening of the authors' earlier research effort. (See: Anderson, C. Dennis and John D. Claxton, Impact on Consumer Refrigerator Purchases of Energy Information at Point of Sale, prepared for Consumer and Corporate Affairs, Canada, March, 1979).

The present study was carried out with the support of Consumer and Corporate Affairs, Canada. In particular the authors would like to acknowledge the interest and assistance of: Dr. Geoffrey Hiscocks, Mr. Lee McCabe, Mr. Carman Cullen, and Ms. Wendy Hurst of the Consumer Research and Evaluation Branch of that department; and Mr. Roy Buschfied and Mr. John Buchanan of the Standards Branch.

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Also, the contribution of Ms. Michelle Stuart, our research assistant is gratefully acknowledged. She did a remarkable job assisting two geographically dispersed masters at all stages of this research study. Finally, we thank Susan Harder for her skillful typing of the report.

TABLE OF CONTENTS

	PAGE
PREFACE	i
TABLE OF CONTENTS	ii
1.0 INTRODUCTION	1
1.1 Background to ENERGUIDE	1
1.2 ENERGUIDE Program Objectives	5
1.3 Initial Research on the Impact of ENERGUIDE	5
1.4 Purposes of the Present Study	5
2.0 NATURE OF THE STUDY	7
2.1 Rational for the Study	7
2.1.1 Macro evaulation of ENERGUIDE	8
2.1.2 Micro evaluation of ENERGUIDE	9
2.2 Study Objectives	9
2.3 Study Methods and Data	9
2.3.1 Information from manufacturers	9
2.3.2 Information from retailers	10
2.3.3 Information from consumers	10
3.0 PRODUCER PERSPECTIVES ON ENERGUIDE	12
3.1 Introduction	12
3.2 Industry Background	13
3.2.1 Industry ownership and structure	13
3.2.2 Industry sales trends for major appliance types	15
3.2.3 Summary	18
3.3 Trends in Energy Consumption of Individual Producers' Fleet Refrigerator Sales	18
3.4 Analysis of ENERGUIDE Directories for 1979 and 1980	20
3.4.1 Overview of changes in refrigerator models	20
3.4.2 Details of changes in refrigerator models	21
3.5 Summary of Manufacturer and Retailer Brochures	28
3.6 Specific Case Histories of Producers' Refrigerator and Freezer Modifications to Improve Energy Efficiency	29

PAGE

3.7 Industry-Government Controversy on Costs of Compliance with ENERGUIDE 34
3.7.1 Industry vs government cost estimates for application of ENERGUIDE to refrigerators . . 35
3.7.2 A third party view on ENERGUIDE costs to producers 36

3.8 Other Producer Concerns 37
3.8.1 Location of the label 37
3.8.2 In-home variance in appliance energy use . . . 38

3.9 Summary 39

4.0 RETAILER PERSPECTIVES ON ENERGUIDE 41

4.1 The Potential Role of Retailers in Consumer Appliance Purchases 41

4.2 Retailer Survey Findings 42
4.2.1 The retailers in the sample 43
4.2.2 Information from retailers 43

4.3 Summary 47

5.0 CONSUMER SURVEY 48

5.1 Methods 48

5.2 Findings 50

5.3 Summary 54

6.0 SUMMARY AND CONCLUSIONS 55

6.1 Background 55

6.2 Summary of Current Findings 57

6.3 Unanswered Questions 58

6.4 Conclusions 60

APPENDIX
List of Contents In Order of Presentation

1. Excerpts from the 1980 ENERGUIDE Directory: Refrigerators and Freezers

2. "Energy Labels for Appliances". The authors' article based on an initial (1978) evaluation of the likely impact of ENERGUIDE information on consumers' refrigerator decisions

3. Summary of Refrigerator model changes: 1980 vs. 1979 ENERGUIDE Directories

4. Excerpts from Canadian Electric Association "Task Force Report Addressing Additional ENERGUIDE Costs For Range Manufacturers"

5. Retail letter

6. Retail questionnaire

7. Frequency distributions for retail questionnaire responses

8. Cross tabulations of retail questionnaire responses by geographic region

9. Cross-tabulations of retail questionnaire responses by store type

10. Consumer survey: questionnaire

11. Consumer survey: characteristics of the sample

12. Consumer survey: frequencies for refrigerator buyers

13. Consumer survey: frequencies for freezer buyers

14. Consumer survey: cross-tabulations by city

15. Consumer survey: cross-tabulations by store type

1.0 INTRODUCTION

Canada, like many other countries, has sought ways to curb energy demand in face of increasingly expensive and dwindling energy supplies. An important conservation policy initiative recently implemented by the Canadian government is the ENERGUIDE energy labeling program for major household electrical appliances. The purpose of the present research is to evaluate the impact of this new mandated disclosure requirement on Canada's appliance manufacturers, retailers and consumers.

This report is divided into six major sections. The remainder of section one provides background on the ENERGUIDE program, its objectives and an earlier evaluation study that focussed on initial consumer response. Section two outlines the objectives and approaches of the present research studies undertaken to assess producer, retailer and consumer response to the new program. Section three analyzes producer perspectives on ENERGUIDE while sections four and five deal with retailer and consumer perspectives, respectively. Finally, section six contains recommendations for ongoing management of the ENERGUIDE program.

1.1 Background to ENERGUIDE*

The ENERGUIDE program was initiated by the federal government of Canada in January, 1977. This policy initiative was motivated by the

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* This section is based on descriptions of the Program contained in various booklets, background papers, speeches and other materials obtained from Consumer and Corporate Affairs, Canada.

thought that, as energy costs increase, the ENERGUIDE program would have the potential of reducing domestic energy consumption (demand) quickly and significantly at relatively low cost (in contrast to the expensive and time consuming efforts to find and develop new sources of energy supply).

The ENERGUIDE program consists of three basic elements:

(1) a regulation that will require the major household electrical appliances to carry a label stating the energy consumption of each appliance

(2) the development of energy consumption standards, test procedures and inspection activities to provide credible energy consumption ratings for each appliance model

(3) a program to inform consumers about ENERGUIDE and to educate them as to how they can conserve energy through better choice, use, care and maintenance of appliances

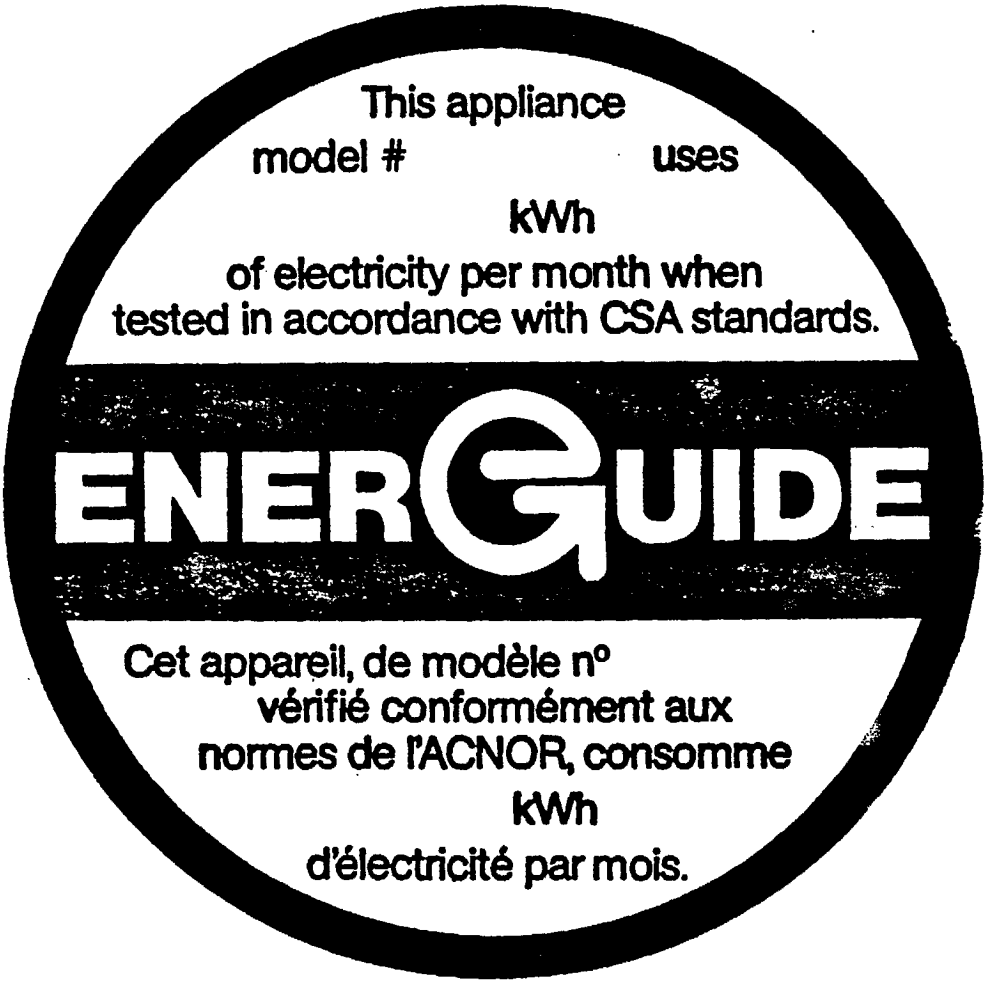
The ENERGUIDE label stating energy consumption in kwh/month is shown in Figure 1 on the next page. It is supported by new regulations under the Consumer Packaging and Labeling Act which requires that an energy consumption label be prominently displayed on all major household electrical appliances -- including imports -- manufactured as of a specified date and sold in Canada. These regulations are examined and authorized by the Federal Cabinet and subsequently become public when they appear in the Canada Gazette.

The first regulation (refrigerators labeling) became effective September 30, 1978. The mandatory labeling of freezers became effective November 30, 1979 and the remaining major electrical appliances dishwashers, clothes washers, clothes dryers and ranges are expected to come under the regulation by 1981.

Participation in the ENERGUIDE program is a joint effort of consumers, industry, utilities and governments. It was developed by a

FIGURE 1

CANADA'S ENERGUIDE LABEL FOR REFRIGERATORS AND FREEZERS



committee of the Canadian Standards Association (CSA), that is, CSA's Steering Committee on Performance of Electrical Products (SCOPEP). This Committee includes representatives from the:

Canadian Appliance Manufacturers Association (CAMA),

Canadian Electrical Association (CEA),

Canadian Electrical Contractors' Association of Canada (CECAC),

Canadian Electronic and Appliance Service Association (CEASA),

Consumers' Association of Canada (CAC),

Consumer and Corporate Affairs Canada (CCAC),

Provincial Governments,

Retail Council of Canada (RCC) and

Retail Merchants Association of Canada Inc. (RMAC).

The launch of the ENERGUIDE program resulted from the co-operation of individuals, groups and institutions organized under the umbrella of the Steering Committee on Performance of Electrical Products (SCOPEP).

The SCOPEP committee developed standardized test procedures for measuring appliance energy consumption. The manufacturers are requried to test each appliance model type and apply an ENERGUIDE label to their units at the point of production. CSA performs verifying tests on a sample of manufacturers output.

Consumer and Corporate Affairs Canada (CCAC) in contract with the Canadian Standards Association have produced annual ENERGUIDE Directories for major household electrical appliances which list appliances by model, manufacturer, retailer, capacity, freezing capability and energy consumption ratings. Excerpts from the 1980 ENERGUIDE Directory for Refrigerators and Freezers are contained in the

appendix.

The government has made efforts to inform consumers about ENERGUIDE. Copies of the Directories have been distributed without charge to consumers through the consumers' associations, the electric utilities, CCAC regional offices and the retailers. Other Directories including those for dishwashers, clothes washers, clothes dryers and ranges are now being developed and will likewise be distributed to the consumer at no charge.

The government's initial efforts at reaching the consumer also included the following activities and elements:

- introduction of the ENERGUIDE label through a "billing stuffer" with the co-operation and assistance of the many electric power utility organizations (Canadian Electrical Association) across Canada ... reaching more than five-million homes;

- the distribution of ENERGUIDE pamphlets, outlining "Energy Saving Suggestions" to consumers. These pamphlets explain to the consumer how to use an appliance in the most efficient fashion in order to save energy and money. This pamphlet is made available through the utility offices, retail outlets, consumer associations and CCAC regional offices.

Retailers have also been a target audience for information on ENERGUIDE. To develop retailer involvement in this program, Consumer and Corporate Affairs Canada undertook the following steps:

- produced and distributed 750,000 copies of the ENERGUIDE Directory of Refrigerators and Freezers to consumers and retailers;

- produced and distributed to retailers a comprehensive "ENERGUIDE Information Kit for Retailers" designed to answer questions by retailers and their salespeople, providing them with the necessary information to further promote the new ENERGUIDE label to their customers; and

- to further support the retailers' promotion of the ENERGUIDE label, the government has produced and distributed to retailers (with the major assistance of the provincial electric utilities) a professionally-designed, self-supporting point-of-purchase display with a dispensing pocket for booklets

containing additional consumer information.

1.2 ENERGUIDE Program Objectives

The ENERGUIDE program has three major objectives. The first is to enable consumers to choose energy efficient appliances and achieve energy and financial savings by doing so. The second objective is to encourage appliance manufacturers to produce and promote more energy efficient appliances. The third objective is to encourge retailers to stock and promote energy efficient appliance models.

1.3 Initial Research on the Impact of ENERGUIDE

In the fall of 1978, just prior to the introduction of ENERGUIDE labels on refrigerators the authors carried out a major field experiment to assess the likely initial impact of refrigerator energy labels on consumers' purchase decisions. The research approach and findings are highlighted in a recent article by the authors which is presented in the appendix of the present report. This initial research focussed on consumer response to ENERGUIDE labels and salesperson emphasis of energy information. Briefly, the major finding was that consumers tended to choose more energy efficient manual defrost refrigerators in the presence of refrigerator energy consumption information at the point of sale. Thus, the likely initial impact of the ENERGUIDE program would be to facilitate a shift in consumer choice from frost free to manual defrost refrigerators among those consumers who are interested in small size (under 14 cubic foot capacity) refrigerators.

1.4 Purposes of the Present Study

The present study is a comprehensive attempt to assess the im-

pact of the ENERGUIDE program on all three levels in the marketing system for appliances: manufacturers, retailers and consumers. The general purpose is to determine the extent to which the objectives of the ENERGUIDE program are being met approximately two years after the first ENERGUIDE regulation (for refrigerators) was implemented. In contrast to the initial (1978) research study, the present investigation address all three program objectives cited above. Further details on the nature of the present investigation is contained in the following section of this report.

2.0 NATURE OF THE STUDY

This section of the report discusses three topics. First, the rationale of the current study is discussed in terms of earlier research. Second, the study objectives are presented. Finally, the research methods and resulting data are outlined.

2.1 Rationale for the Study

The earlier research that evaluated the ENERGUIDE energy labelling program had several limitations. First, the research was conducted at the outset of the ENERGUIDE program, and as a result indications of impact on consumer decisions must be considered to be very preliminary. Second, the study was conducted in cooperation with one major department store chain. Subsequent research must consider consumer shopping in a broader range of retail outlets. Finally, the earlier study was restricted to people buying refrigerators in Western Canada. Clearly consumers in other parts of the country may consider energy information either more or less significant. A major purpose of the research being presented in this report was to address these three limitations.

A second major purpose of the current study was to address the research needs of ongoing ENERGUIDE program management. These research needs fall into two general categories. First, at a macro level there is the need to evaluate the overall impact of the ENERGUIDE program in terms of reducing energy consumption of major household durables. On the other hand, at the micro level there is a need to evaluate the impact of specific management initiatives. For example, materials have been developed to enable retail salespeople to

better utilize energy information in their sales presentations and research can be used to help assess the impact of these specific support materials.

2.1.1 Macro evaluation of ENERGUIDE. Two types of objectives can be ascribed to the ENERGUIDE program. At a very general level all energy conservation programs potentially contribute to increasing the level of consumer concern and commitment to the national energy conservation interest. In other words, it could be argued that consumers hearing frequent conservation messages from multiple sources will gradually internalize the significance of the issue. In this context ENERGUIDE can be viewed as one of many information inputs intending to increase consumers' concern for energy conservation. It should be noted, however, that this general objective is not operational in terms of having clearly measurable results. Because consumer attitudes toward energy conservation may be influenced by a broad range of factors, attributing specific attitude change to the ENERGUIDE program is virtually impossible. The reason for identifying this general objective is to recognize that programs such as ENERGUIDE can have important side benefits.

The central objective of ENERGUIDE is to reduce the energy consumption of the major household appliances being purchased by consumers. This objective may be reached because the energy labels (1) cause manufacturers to improve the energy efficiency of the products produced, (2) cause retailers to focus efforts on stocking and promoting energy efficient models, and/or (3) cause consumers to compare and purchase products based on energy usage information. Thus, to evaluate the impact of ENERGUIDE requires assessment of impact on all

three groups.

2.1.2 Micro evaluation of ENERGUIDE. Management of the ENERGUIDE program requires information regarding the effectiveness of specific aspects of the program. For example, can consumers understand kilowatt-hour information, is the label located so that consumers will notice it, is the information produced to support retail salespeople being utilized? The earlier study addressed several questions of this type. Ongoing research must continue this type of evaluation.

2.2 Study Objectives

The current study had three major objectives regarding the impact of the ENERGUIDE program:

- interview manufacturers to assess impact in terms of product changes and energy related promotional emphasis
- interview retailers to assess impact in terms of products carried and energy emphasis by retail salespeople
- interview consumers to assess impact on awareness, attitudes and behavior regarding appliance energy usage information

2.3 Study Methods and Data

At the time of this study ENERGUIDE labels on refrigerators had been in the market place for more than one year, and freezer labels had just been introduced to the market. The manufacturer and retailer portions of the current study centered on household refrigerators but the consumer study involved both refrigerators and freezers.

2.3.1 Information from manufacturers. Personal interviews were conducted by the principal researchers with a dozen officials from six Canadian appliance manufacturing companies. The interviews were conducted during November and December 1979. The purpose of these

interviews was to obtain the following information:

- the industry view regarding difficulties encountered as the ENERGUIDE program was being set up
- recent energy related product changes with case histories describing the nature and results of these changes
- sales data by model to indicate trends in sales of energy efficient refrigerators
- copies of sales brochures that manufacturers supply to retailers to check the incidence of energy related messages

2.3.2 Information from retailers. Telephone interviews with retailers across Canada were conducted in February and March 1980. Eight cities were selected to provide a geographical cross section: Halifax, Quebec, Montreal, Toronto, London, Winnipeg, Calgary, and Vancouver. In each city, interviews were conducted with appliance sales managers in three types of stores: major department stores, regional chains, and independent appliance retailers.

The information obtained in these interviews included the following:

- the degree to which energy information is discussed with customers
- sales staff knowledge regarding their most energy efficient refrigerators and the residential electricity rates in their local area
- use of energy sales aids in sales presentations
- use of energy messages in advertisements
- efforts to be competitive in terms of having energy efficient models in stock
- retailers' evaluation of the impact of ENERGUIDE labels and sales aids
- information about the store

2.3.3 Information from consumers. In the fall of 1980 (two years after the introduction of ENERGUIDE labels on refrigerators and

one year after their introduction on freezers) a national sample of recent refrigerator and freezer buyers were surveyed. Eight major cities across Canada were included in the study. A total of 1467 questionnaires were mailed out and 583 (40% response rate) were returned. The questionnaire used was largely a replication of the instrument used in the author's 1978 Consumer survey.

The major objectives of the consumer study were:

- to determine the impact of ENERGUIDE lables on current consumer appliance purchase decisions
- to monitor the trend in ENERGUIDE label impact by comparing 1980 survey findings with the findings of the consumer survey done in 1978.

Further details on the methodology of the 1980 study are presented at the beginning of section 5 of this report.

3.0 PRODUCER PERSPECTIVES ON ENERGUIDE

3.1 Introduction

An important objective of the ENERGUIDE program is to encourage manufacturers to continue to improve the energy consumption of their appliances. In other words, the program is intended to influence producers product design and production decisions. This is an indirect approach to achieving consumer energy savings in that the focus is on altering the energy characteristics of the units supplied to consumers rather than attempting to produce shifts in the energy consumption of the units chosen by consumers.

This indirect approach is appealing in that it does not rely on consumer decision making; every purchase decision can be affected in an energy saving direction. However, there are producer costs associated with product design changes and program compliance and it is possible that overall costs will offset the consumer savings benefits. Certainly, appliance manufacturers can be expected to be concerned about the net benefits of the ENERGUIDE program.

The purpose of this section is to analyze how appliance manufacturers have responded to the new ENERGUIDE regulation. Both aggregate responses and specific case histories are presented. Two data sources are utilized:

Secondary Data:
- ENERGUIDE directories
- industry association documents
- government documents

Primary Data:
- appliance manufacturer interviews

NOTE: In the fall of 1979 a dozen personal interviews were conducted with technical and marketing representatives from

Canada's six largest major appliance manufacturing companies. The main focus of the interviews was on manufacturer attitudes and actions regarding the mandated energy labeling program, ENERGUIDE, for refrigerators. Some information was also obtained on manufacturer views of the impending application of this program to other major appliances). An attempt was made to obtain sales trend data, specific case histories of product design changes, compliance costs and other technical and attitudinal consequences which could be attributed, at least in part, to ENERGUIDE.

The secondary and primary information assembled is summarized according to the following topics:

- industry background
- producers sales trends (before and after ENERGUIDE)
- producers product changes (analysis of ENERGUIDE directories for 1979 and 1980)
- specific case histories of product design changes
- producer perspectives on costs/benefits of ENERGUIDE
- producer perspectives on other ENERGUIDE issues

3.2 Industry Background

The following presentation is designed to give the reader an indication of the structure and product sales mix of Canada's major appliance industry.

3.2.1 Industry ownership and structure. The relatively high degree of concentration and U.S. affiliation in Canada's appliance industry is indicated in the following excerpt from a 1978 report, Profile of the Major Appliance Industry in Canada, prepared by the federal Department of Industry, Trade and Commerce:

The dominant multi-product major appliance manufacturers in the U.S. are: General Electric, Whirlpool and White Consolidated Industries; smaller, but still important, are Admiral and McGraw Edison. All of these companies have a significant ownership presence in the Canadian industry.

Their relative position in the U.S. is roughtly reflected in the Canadian industry structure. The remainder of the industry is Canadian owned. Following is a list of the manufacturers and their ownership.

Canadian Manufacturer	Ownership
CAMCO Ltd.	60% Canadian General Electric (Subsidiary of General Electric U.S.); 40% GSW Ltd. (Canadian Company with shares publicly traded). (NB: voting control is 50-50).
Inglis Ltd.	43% Whirlpool (U.S.); 20% Simpsons-Sears (Canadian Company with U.S. participation); 37% other shareholders (including Canadian).
WCI Canada Ltd.	91% White Consolidated Industries (U.S.); 9% other shareholders (including Canadian).
Canadian Admiral Corp. Ltd.	Subsidiary of Admiral (U.S.) which in turn is a part of the North American Rockwell Corporate Group.
McGraw Edison of Canada Ltd.	Subsidiary of the McGraw Edison Company (U.S.)
BFG Industries	Subsidiary of York Lambton Corp. (Canadian)
The W.C. Wood Co. Ltd.	Canadian owned (private)
The Enterprise Foundry Ltd.	Canadian owned (private)
General Freezer Ltd.	Subsidiary of Canadian Manoir Industries Ltd. (Canadian)
Keeprite Ltd.	Publicly traded Canadian company.

The corporate consolidation activities of the last ten or fifteen years have resulted in a high degree of concentration in

a once considerably fragmented industry. Five of the six multi-product appliance manufacturers have corporate relationships with U.S. based manufacturers; the sixth, and smallest, BFG Industries, is Canadian owned and has a strong regional orientation to the province of Quebec. The remaining manufacturers are also Canadian owned and operated, and have specialized in specific product areas.

3.2.2 Industry sales trends for major appliance types. Table 3.1 indicates actual and forecast domestic production sales by major appliance type. (Imports, about 12% of all domestic sales, and exports are not included in these figures). As indicated approximately three million domestically produced appliance units are sold annually as of 1980. At this date the ENERGUIDE labeling requirement has been implemented for refrigerators and freezers sold to consumers (not builders). Domestic shipments for these two appliance types as of 1980 are expected to be as follows:

	Total	Builder	Consumer
Refrigerators - 000 units	625	120	505
(% all appliances)	(20.5)	(3.9)	(16.6)
Freezers - units	330		
(% all appliances)	(10.8)		

Thus, as of 1980, only about 27% of Canadian produced major appliance units sold in Canada are covered by ENERGUIDE labels. (All import freezers and refrigerators over a minimum size will also be labeled). It is expected that this percentage will increase significantly in the near future as the following schedule of energy labeling is instituted.

Other Appliance types to be covered by ENERGUIDE	Expected Date
dishwashers	October 31, 1980
clothes washers	October 31, 1980
clothes dryers	December 31, 1980
ranges	December 31, 1980

TABLE 1

TRENDS IN MAJOR APPLIANCE SALES (1979-1984)[1]

		ACTUAL					FORECAST					
		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
REFRIGERATORS	Builder	124	101	106	125	127	120	120	125	125	130	130
	Other	558	480	455	470	489	495	505	520	535	545	555
	Total	682	581	561	595	616	615	625	645	660	675	685
FREEZERS		309	475	362	289	318	320	330	340	345	355	365
ELECTRIC RANGES (INCL. B/I)	Builder	127	96	103	121	120	115	115	120	120	125	125
	Other	442	383	388	385	388	395	405	415	425	430	440
	Total	569	479	491	506	508	510	520	535	545	555	565
MICROWAVE OVENS		22	35	65	76	98	110	125	150	180	220	265
GAS RANGES		51	30	25	30	25	30	32	32	33	33	35
WASHERS	Automatic	468	426	461	469	473	480	500	520	540	560	575
	Wringer/ Twin/Tub	186	128	100	90	85	65	60	55	50	45	40
	Total	654	554	561	559	558	545	560	575	590	605	615
DRYERS	Electric	423	378	394	394	389	400	415	430	445	460	475
	Gas	15	11	13	13	13	13	12	11	11	11	11
	Total	438	389	407	407	402	413	427	441	456	471	486
DISHWASHERS		260	255	261	243	291	300	310	320	335	355	375
ROOM AIR CONDITIONERS		170	185	191	127	109	115	120	125	135	140	145
TOTAL MAJOR APPLIANCES		3,155	2,983	2,924	2,832	2,925	2,958	3,049	3,163	3,279	3,409	3,536

[1]Canadian market only, exports not included.

SOURCE: Major Appliances: Industry Forcast (1979), Toronto: Canadian Appliance Manufacturers Association.

TABLE 2

REFRIGERATOR CUBIC CAPACITY TRENDS - CAMA[1] SALES

	1974		1975		1976		1977		1978	
1-DOOR MANUAL DEFROST	UNITS	%	UNITS	%	UNITS	%	UNITS	%	UNITS	%
UNDER 9.5 CUBIC FEET	6,541	1.0	24,589	4.3	24,105	4.4	27,037	4.7	25,164	4.3
9.5 - 12.4	80,229	12.2	68,110	11.9	71,278	13.0	80,666	14.1	76,276	12.9
12.5 AND OVER	42,021	6.4	31,590	5.5	29,413	5.3	34,467	6.0	35,709	6.0
TOTAL	128,791	19.6	124,289	21.7	124,796	22.7	142,170	24.8	137,149	23.2
1-DOOR AUTOMATIC DEFROST										
UNDER 13.5 CUBIC FEET	22,676	3.5	11,276	1.9	4,440	0.8	5,480	1.0	5,204	0.9
2-DOOR AUTOMATIC DEFROST										
UNDER 13.5 CUBIC FEET	24,588	3.7	13,590	2.4	14,353	2.6	11,818	2.0	13,112	2.2
13.5 AND OVER	18,280	2.8	13,305	2.3	6,379	1.2	10,732	1.9	10,382	1.8
TOTAL	42,868	6.5	26,895	4.7	20,732	3.8	22,550	3.9	23,494	4.0
2-DOOR NO-FROST TOP FREEZER										
UNDER 13.5 CUBIC FEET	113,143	17.2	99,047	17.2	96,197	17.5	103,529	18.1	94,589	16.0
13.5 - 14.4	74,573	11.4	65,285	11.3	60,664	11.0	63,054	11.0	72,486	12.2
14.5 - 15.4	126,146	19.2	106,652	18.6	100,316	18.3	90,195	15.8	100,175	16.9
15.5 - 17.4	109,990	16.7	110,199	19.1	110,969	20.2	113,653	19.8	125,767	21.3
17.5 AND OVER	2,112	.3	3,585	.6	3,953	.7	3,288	.6	3,926	0.7
TOTAL	425,964	64.8	384,768	66.8	372,099	67.7	373,719	65.3	396,943	67.1
SIDE-BY-SIDE										
UNDER 17.5 CUBIC FEET	6,949	1.1	4,341	.7	2,456	.4	1,455	.2	1,163	0.2
17.5 - 19.4	20,366	3.1	19,525	3.4	20,421	3.7	22,143	3.9	22,508	3.8
19.5 AND OVER	9,091	1.4	4,465	.8	4,704	0.9	5,166	.9	4,914	0.8
TOTAL	36,406	5.6	28,331	4.9	27,581	5.0	28,764	5.0	28,585	4.8
MISCELLANEOUS	50	-	-1	-	-1	-	-	-	-	-
GRAND TOTAL	656,755	100.0	575,558	100.0	549,647	100.0	572,683	100.0	591,375	100.0

[1]SOURCE: Major Appliances: Industry Forcast (1979), Toronto: Canadian Appliance Manufacturers Association.

Table 3.2 indicates trends in sales statistics for specific types of refrigerators. As indicated, in 1978 about 72% of sales are of the frost free model compared to 23% for manual defrost and 5% for automatic defrost. Refrigerators are a mature product (near market saturation); total unit sales in the 1974 to 1978 period have been quite stable at around the 600,000 figure. There is a slight trend towards increasing sales of manuals (20% in 1974 compared to 23% in 1978) and frost free (70% in 1974 compared to 72% in 1978). Sales of automatic defrost units have declined from 10% in 1974 to 5% in 1978. The forecast is for manuals to decrease to about 20% by 1984, for automatic defrost to decrease to about 3%, and for frost free to increase to about 76%.

Specific capacity trends for refrigerators, across all defrost types, are as follows:

	Sales of Refrigerators	
	1973	1978
Under 9.5 cu. ft.	0.3%	4.3%
9.5 - 13.4 cu. ft.	48.2%	34.9%
13.5 - 15.4 cu. ft.	31.6%	34.0%
15.5 cu. ft. and over	19.9%	26.8%
	100%	100%

There is a noticeable increase in sales of larger refrigerators. For example in the 1973 to 1978 period, there was a 13% decline in the sales of 9.5 to 13.4 cubic foot capacity models compared to a

6.9% increase in sales of the 15.5 (cubic foot capacity) and over models in the same period.

Table 3.3 contains trends in types of freezers sold. As indicated chest type models dominate the market (92% of sales compared to 8% for upright types). In contrast to refrigerator capacity trends, there has been a shift toward smaller sizes in freezer sales. Perhaps because refrigerators (and, particularly the freezer sections of refrigerators) have become larger consumers are opting for smaller freezers. For example, the percentage of chest type freezer sales in the small size range (14 cu. ft. and under) increased from 43% in 1973 to 54% in 1978. Meanwhile, the sales in larger sizes (18 cu. ft. and over) dropped from 37% to 26%.

Table 3.3

FREEZER CUBIC CAPACITY TRENDS - CAMA[1] SALES

Type		Percent of Market		
		Actual		Forecast
		1973	1978	1984
Chest:		92%	92%	90%
14.0 cu. ft. and under	43%		54%	
14.0 - 17.8 cu. ft.	20%		20%	
18.0 - 22.9 cu. ft.	29%		21%	
23.0 cu. ft and over	8%		5%	
total	100%		100%	
Upright:		8%	8%	10%
14.0 cu. ft. and under	51%		50%	
14.0 - 17.9 cu. ft.	44%		48%	
18.0 cu. ft. and over	5%		2%	
total	100%		100%	
TOTAL		100%	100%	100%

[1] Source: Same as Table 3.1.

3.2.3 Summary. The Canadian appliance industry is concentrated among ten or fewer manufacturers most of whom are owned in whole or in part by U.S. parent appliance companies. This structure would seem to permit ready transfer of energy efficient designs from the U.S. to Canada and vice versa.

Sales trends for appliances reveal continuing changes in sales performance of model types within a product category. These trends are likely attributable to changing technologies, marketing programs, consumer tastes and other market forces. It is important to bear these evolutionary sales trends in mind in making any assessment of the impact of the ENERGUIDE program on producer product decisions and sales. It would be a gross overestimate to attribute all changes in the mix of models produced and sold during or after the implementation of ENERGUIDE as resulting from this energy disclosure regulation.

3.3 Trends in Energy Consumption of Individual Producers Fleet Sales of Refrigerators

During the November 1979 personal interviews with appliance manufacturers, an attempt was made to determine whether the company was experiencing any shift in refrigerator sales towards its more energy efficient models. ENERGUIDE labels had been in effect on refrigerators for one year and there had been considerable publicity about the program.

Manufacturers were naturally reluctant to disclose sales figures by refrigerator model type (hence by energy consumption level). Some refused to divulge any data and others were willing only to provide aggregate sales statistics. However, several producers provided de-

tailed sales figures by refrigerator model type for 1978 and 1979. These data were used to compile the summary figures presented in Table 3.4

As indicated in Table 3.4, three producers' sales for 1978 and 1979 are described in terms of number of models, approximate share of the consumer market unit sales, weighted average capacity (cu. ft.) of unit sold, weighted average energy consumption (kwh/mo) and an index figure of kwh/cu. ft. Several observations can be made on the figures presented:

- Overall, there are only small shifts in the average capacity and energy consumption of producers' fleet sales over the 1978 to 1979 period.
- In all cases the fleet average refrigerator capacity (size) and the fleet average energy consumption increased slightly in 1979 over the 1978 figures.
- The index of average kwh/cu. ft., however, increased for one small producer (A), remained almost stable for another small producer (B) and decreased for the third and largest producer (C).

The fact that fleet average size for refrigerators sold has increase from 1978 to 1979 is consistent with the well established trend in the industry over the past five years (see Table 3.2, above). The slight increase in fleet average energy consumption may be attributable to this trend for larger sized refrigerators in that, generally, larger sized units have higher energy consumption numbers. Perhaps the index, kwh/cu. ft., is a more relevant indicator of changes in energy consumption of refrigerator sales. On this basis, it appears consumers purchased units in 1979 that were slightly more energy efficient than units purchased in 1978, at least in the case of the largest producer (C).

The data in Table 3.4 do not permit calculations of the total

TABLE 3.4

INDIVIDUAL PRODUCER TRENDS IN ENERGY CONSUMPTION
OF REFRIGERATOR SALES

(Non-contact market)

Producer (# models)	1978 Fleet Sales			1979 Fleet Sales		
	Average Size (cu.ft.)[1]	Average kwh/mo.	Index kwh/cu.ft.	Average Size (cu.ft.)[1]	Average kwh/mo.	Index kwh/cu.ft.
A (20)	14.08	139.20	9.89	14.29	143.99	10.08
B (7)	15.40	157.93	10.26	15.41	158.21	10.27
C (14)	14.63	137.96	9.43	14.78	138.90	9.40

[1] Size refers to total cubic foot capacity as listed in 1979 ENERGUIDE Directory of Refrigerators published by Canadian Standards Association.

energy savings or costs reflected in refrigerator fleet sales trends from 1978 to 1979. However, these data are illustrative of the kind of measures that should be monitored for each producer on an ongoing annual basis. Trends in these figures over the next few years should show interesting shifts since it is apparent from analysis of 1979 versus 1980 ENERGUIDE Directory that many producers have reduced the energy consumption of existing refrigerator models or have added new more energy efficient models to their product lines.

Analysis of the ENERGUIDE Directory information for 1979 and 1980 is presented in the following sub-section of this report.

3.4 Analysis of ENERGUIDE Directories for 1979 and 1980

One approach to monitoring the extent of producer attempts at energy efficiency improvements is to analyze changes in the model consumption ratings published in the yearly publication, ENERGUIDE Directory (Canadian Standards Association). These directories (see appendix for excerpts) record all energy ratings for refrigerator (and freezer) models by manufacturer and retailer brand. Following is a summary of the changes noted for refrigerator models in the 1980 vs. the 1979 directories.

3.4.1 Overview of changes in refrigerator models. Based upon the refrigerator energy consumption data in the ENERGUIDE Directories of 1979 and 1980, it is evident that improvements in the energy efficiency of refrigerators have been made by a number of manufacturers. It is also evident that other manufacturers can definitely improve the energy efficiency of their products. Notably, American manufacturers still appear to have an edge on their Canadian counterparts.

As Canadian consumers become more knowledgeable in this area and demand energy efficient appliances further improvements will likely

be noted. In addition, research, design and development activities undertaken by manufacturers should result in more efficient products.

Eleven manufacturers are represented in the 1980 ENERGUIDE Directory. Two of these, Dalimplex Ltd. and The Danby Corporation did not have products in the 1979 Directory. Of the nine represented in the '79 and '80 directories, four manufacturers made improvement in energy consumption of at least one of the models. Five of the nine manufacturers expanded their lines in terms of sizes and types of models offered.

Sixteen retailers are represented in the 1980 ENERGUIDE Directory. All had products outlined in the 1979 Directory. Thirteen of the sixteen register energy consumption improvements in at least one of their models.* (Only five manufacturers comprise the product lines represented by sixteen retailers and nineteen retailer brand names). Three of the sixteen retailers expanded their lines in terms of sizes and types of models offered: two reduced the sizes and types of models offered; one added a new model but reduced the range of sizes available.

3.4.2 Details of changes in refrigerator models. This sub-section lists details of changes in the type and energy consumption of refrigerator model produced and stocked by manufacturers and retailers. In interpreting these details it is important to bear several points in mind:

- Many manufacturers made improvements in their models' energy consumption prior to publication of the first (1979) ENER-

* That is, at least one model stocked in 1980 registers a lower energy consumption rating than the same model type or size for 1979.

GUIDE Directory (some specific examples of this are cited in the case histories of model changes contained in sub-section 3.6 below).

- Most manufacturers distribute the same basic refrigerator unit (and, therefore, the same energy rating) under two or more brand names. Hence the number of new models added or energy efficiency improvements made is overstated in the following detailed presentation of manufacturer and retailer refrigerator model changes between 1979 and 1980.

With these cautions in mind, the following details result from comparison of the 1979 and 1980 ENERGUIDE directories for refrigerators:

(1) Manufacturers

Canadian Admiral Corp. Ltd.
Brands: Admiral

Offer same range of sizes and types as last year. Apparently made improvements to three models. The 15.5 cu. ft. top mounted freezer model improved from 165* to 104. The 18.2 cu. ft. 2 and 3 door side-by-side models improved from 262 to 175 in one model and from 262 to 143 in another.

Amana Refrigeration Inc.
Brands: Amana

Offer five new sizes and one new 2 door top mounted freezer model with semi-automatic defrost in three sizes. Note: These additions could well represent an expansion in the number and size range of models imported from Amana Inc., for sale in Canada and, thus, would not be strictly "new" 1980 models.

Comparatively, all models are efficient in terms of energy consumption ratings.

B.F.G. Industries (Findlay's Ltd.)
Brands: Belanger, Findlay, Gurney

Belanger: Offer same range of types and one new size. New size 15.5 cu. ft. 2 door top mounted freezer model. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101. No other improvements.

Findlay & Gurney: Same range of sizes and types as '79. Appar-

* All changes quoted are in kilowatt-hours/per month.

ently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101. No other improvements.

Canadian Appliance Mfgr. Co. Ltd.
Brands: General Electric, Hotpoint, McClary, Moffat

All four brands offer same models as '79. No improvements made. One exception, Moffat added new single door 14 cu. ft. no freezer model at competitive energy consumption rating.

WCI (Canada) Ltd.
Divisions: Roy-Gibson, Kelvinator, White-Westinghouse

Roy-Gibson Division
Brands: Roy-Gibson, Le Baron

Roy-Gibson
One new size and one new 18.0 cu. ft. 3 door "side-by-side" model. Apparently improved 2 door top mounted freezer model in three sizes. The 13.5 cu. ft. size improved from 145 and 156 to 132 and 143. The 15.0 cu. ft. size improved from 167 to 143. The 16.2 cu. ft. size improved from 166 and 174 to 148 and 158.

Le Baron
Same range of sizes and types as '79. Apparently improved 2 door top mounted freezer models in two sizes. The 15.0 cu. ft. model improved from 167 to 143. The 16.2 cu. ft. model improved from 166 to 158.

Kelvinator Division
Brands: Kelvinator, Leonard

Kelvinator
Same range of sizes and types as '79. Apparently improved 2 door top mounted freezer model in three sizes. The 13.5 cu. ft. size improved from 164 to 143. The 15.0 cu. ft. size improved from 167 to 143. The 16.2 cu. ft. size improved from 174 to 148. One model, the 18.0 cu. ft. 3 door "side-by-side" model increased from 205 to 244, probably due to the model alteration from 2 door to 3 door.

Leonard
Same range of sizes and types as '79. Apparently improved 2 door top mounted freezer model in two sizes. The 15.0 cu. ft. size improved from 167 to 143. The 16.2 cu. ft. model improved from 174 to 148.

White-Westinghouse Division
Brands: White-Westinghouse

Same range of types and one new size, 18.0 cu. ft. 3 door

"side-by-side" model. Apparently improved 16.2 cu. ft. 2 door top mounted freezer model from 174 to 148. One model, 25.3 cu. ft. 2 door "side-by-side", increased from 144 to 157.

Inglis Ltd.
Brands: Inglis, Whirlpool

Inglis
Same range of types and one new size. New 19.1 cu. ft. 2 door top mounted freezer model. Apparently improved 17.1 cu. ft. 2 door top mounted freezer models from 190 to 152 and 134.

Whirlpool (not available in '79)
Equivalent but smaller range of sizes and types as Inglis '80. Same improved 17.1 cu. ft. 2 door model as Inglis '80.

W.C. Wood's Co. Ltd.
Brands: Wood's

Same range of sizes and types as '79. No improvements made.

The Danby Corp.
Brands: Gorenje

New in 1980. Offer single door, manual defrost model in two sizes (8.3 and 10.7 cu. ft.). Both have low energy consumption ratings of 34 and 36.

White Consolidated Ind. (Frigidaire Division)
Brands: Frigidaire

Same range of sizes and types as '79. No improvements made.

Elitech Canada Ltd.
Brand: Indesit

One new model available in two sizes. New 2 door top mounted freezer model with semi-automatic defrost in 9.8 and 11.6 cu. ft. sizes, with ratings of 85 and 92, respectively.

Dalimplex Ltd.
Brand: Polar Predom

New in 1980. Offer one model, 8.1 cu. ft. single door, manual defrost model at 32.

(2) Retailers

Hudson's Bay Co. Ltd.
Brands: Baycrest, Beaumark

Baycrest
One new model to previous range of seven sizes and four types. New 18.0 cu. ft. 3 door "side-by-side" model. Apparently improved 2 door top mounted models in three sizes. The 13.5 cu. ft. size improved from 164 to 156 and 143. The 15.0 cu. ft. size went from 167 to 159 and 143. The 16.2 cu. ft. size went from 174 to 148 and 166. One model, 18.2 cu. ft. 2 door "side-by-side" model increased from 196 to 246.

Beaumark
New in 1980. Equivalent range of sizes and types as Baycrest '80. In addition, 13.1 cu. ft. single door manual defrost model at 54 and new 19.2 cu. ft. 2 door "side-by-side" model at 185.

Woolco Dept. Stores
Brand: Brentwood

Same range of types and one less size than '79. Dropped 16.0 cu. ft. 2 door top mounted freezer model. No improvements in consumption rates.

Simpsons-Sears
Brand: Kenmore

One new size and one new type. New 25.0 cu. ft. 2 door "side-by-side" model at 192. New 3 door "side-by-side" 18.2 cu. ft. model at 143 and 175. Apparently improved 17.1 cu. ft. 2 door top mounted models from 190 to 134 and 152. Improved 18.2 cu. ft. 2 door "side-by-side" models from 262 to 143 and 175.

Eaton's
Brands: Viking, Imperial

Viking
One new size to previous range of eight sizes and four types. New size, 21.0 cu. ft. 2 door top mounted freezer model at 135. Improved 2 door top mounted freezer model in three sizes. The 13.5 cu. ft. size improved from 164 to 143. The 15.0 cu. ft. size went from 167 to 143. The 16.2 cu. ft. size went from 174 to 148. One model, 18.0 cu. ft. 2 door top mounted freezer model increased from 205 to 255.

Imperial
Same range of sizes and types. Apparently improved 2 door top mounted freezer models in two sizes. The 13.5 and 15.0 cu. ft.

sizes went from 164 and 167 respectively to 143.

Magasins Prestige Ltd.
Brands: Prestige, Fascination

Prestige
Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. top mounted freezer model from 105 to 101.

Fascination
Two new models available. New 10.43 cu. ft. single door top mounted manual defrost model at 53 and new 18.0 cu. ft. 2 and 3 door "side-by-side" models at 235 and 255. Apparently improved 2 door top mounted freezer model in two sizes. The 15.0 cu. ft. size improved from 159 to 148. The 16.2 cu. ft. size went from 166 to 158.

Magasins Bonne-Valeur
Brand: Generation

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

Marshall-Wells
Brand: Zenith

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

Great Universal Stores (GUS)
Brand: Regent

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

Enamel & Heating
Brand: Fawcett

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

Centre Mondial Ameublements (CMA)
Brand: Centurion

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

A.L.T. Inc.
Brand: Belair

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

P.A.S.
Brand: Eldorado

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

Servimeubles
Brand: Excellence

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

Yvon St.-Gelais
Brand: S.A.C.

Same range of sizes and types as '79. Apparently improved 13.5 cu. ft. 2 door top mounted freezer model from 105 to 101.

Enterprise Foundries Ltd.
Brand: Enterprise

Same range of sizes and types as '79. Apparently improved 2 door top mounted freezer models in three size ranges. The 13.5 cu. ft. models went from 164 to 145 and 156. The 15.0 cu. ft. went from 167 to 159. The 16.2 cu. ft. improved from 174 to 166.

Interprovincial Cooperatives Ltd.
Brand: Viscount

Have reduced range of sizes and types. Dropped two models, 13.2 cu. ft. and 15.1 cu. ft. 2 door top mounted freezer models at 140 and 155, respectively.

The appendix contains detailed tabular summaries of changes in refrigerator models produced/stocked by manufacturers/retailers as derived from a comparison of the ENERGUIDE Directories for 1979 and 1980. The reader should recall that the actual numbers of model ad-

ditions and improvements in consumption of energy are overstated since, frequently, the same mechanical unit appears under two or more manufacturer and/or retailer brand names.

3.5 Summary of Manufacturer and Retailer Refrigerator and Freezer Brochures

A further indication of industry support for energy efficiency is in their product brochures. Of the eight manufacturer brochures and the two retail brochures collected, only two manufacturers (one American based) specifically include the kwh/mo. consumption ratings in the description of their models. All manufacturers mention energy saving features and design, such as insulation or the energy saver switch, in their brochures for at least one of their brand names. Only one brochure shows a picture of the ENERGUIDE label. Specific details follow:

(1) Manufacturers' Brochures

Amana Refrigeration Inc. (Amana)
Stress energy saving features and design. Features mentioned include insulation, energy saver switch, low watt motor. Do not specifically mention kwh/mo. rating for models but make comparison between consumption rates of models and 100 watt light bulb.

Canadian Admiral Corp. (Admiral)
Mention energy saver circuit design. No mention of kwh/mo. consumption rates for each model.

Inglis Ltd. (Inglis)
Mention energy saver switch feature. No mention of kwh/mo. consumption rates for models.

Inglis (Whirlpool)
Stress energy saving features. Features mentioned include insulation, energy saving control device. Gives kwh/mo. rating for specific model. Also, in picture of model, ENERGUIDE label is shown on inside wall of refrigerator.

Canadian Appliance Mfgr. Co. Ltd. (Hotpoint)
Stress insulation and "save on energy costs" for freezers. Mention 20% reduction in energy bills with foam insulation. No

mention of consumption rate (kwh/mo.) for models.

Canadian Appliance Mfgr. Co. Ltd. (General Electric)
Energy saving features mentioned such as insulation and fan off switch. No mention of kwh/mo. ratings for models.

Canadian Appliance Mfgr. Co. Ltd. (Moffat, McClary)
No mention of energy saving features, design or consumption rates.

WCI Canada Ltd. (White Westinghouse Division)
Stress energy saving features such as insulation and energy saver switch. No mention of kwh/mo. ratings for models.

WCI Canada Ltd. (Roy-Gibson Division) (Roy-Gibson, Le Baron)
No mention of energy saving features, design or kwh/mo. consumption rates.

WCI Canada Ltd. (Kelvinator Division) (Kelvinator, Leonard)
Leonard
Stress energy saving features such as "power miser" switch and "energy saving" foam insulation on freezers. No mention of kwh/mo. consumption rates on various models.

W.C. Wood's Co. Ltd. (Wood's)
Freezer brochures stress energy saving features such as foam insulation. Each model has kwh/mo. consumption rate included in description.

Sub-Zero Co. Inc. (Sub Zero)
Give kwh/mo. consumption ratings for each model.

BFG Industries Ltd. (Gurney)
Stress energy saving features such as "energy saver switch". No mention of kwh/mo. consumption rates for each model.

(2) Retailers' Brochures

Eaton's (Viking)
Mention foam insulation. No other mention of energy saving features or kwh/mo. consumption rates for models.

Hudson's Bay Co. (Beaumark)
Mention energy saving features such as insulation and energy saving switch. No mention of kwh/mo. consumption rates for models.

3.6 Specific Case Histories of Producers' Refrigerator and Freezer Modifications to Improve Energy Efficiency

During personal interviews with appliance manufacturers a number

of specific refrigerator and freezer design changes or modifications to materials and components were discussed. The purposes were to document cases where the energy consumption of a model had been reduced, to determine the degree of reduction in energy consumption and to explore the consequences, if any, on the selling price of the model. Following are summaries of these case histories. (Note that in some cases only general information is available).

PRODUCER: P

Case: 1

Model: 17 cubic foot frost-free refrigerator

Date: early, 1978

Modification:
- change from fibreglass to foam insulation
- add energy saver switch
- other materials and structural changes

Result:
- decrease in kwh/mo. = 16 (approx. 9%) due to insulation change
- further decrease in kwh/mo. = 10 (approx. 6%) due to saver switch
- net decrease in manufacturing costs of approx. $2 per unit, no change in producers' selling price

Comments: A combination of factors precipitated this design modification: requests from retailers, impending ENERGUIDE regulation, previously planned (ongoing) engineering design improvement program. Opinion expressed was that energy efficiency modifications were speeded up due to knowledge of impending ENERGUIDE regulation requiring disclosure of refrigerator energy consumption as of Oct., 1978.

PRODUCER: Q

Case: 2

Model: 18 cubic foot frost-free refrigerator

Date: 1978

Modification: . change from fibreglass to foam insulation

Result: . decrease in kwh/mo. = 137 (approx. 53%)

Comments: Planned to switch to foam before conception of ENERGUIDE program but coming of ENERGUIDE precipitated decision to go to thicker foam.

Case: 3

Model: 16 cubic foot frost-free refrigerator

Date: planned for 1980

Modification: . change from fibreglass to foam insulation

Result: . decrease in kwh/mo. = 60 (approx. 36%)

Comments: Change will be made upon completion of major modifications to manufacturing equipment and processes.

PRODUCER: R

Case: 4

Model: 12 cubic foot freezer

Date: Mid 1979

Modifications:
- insulation change from 2" to 2 1/2" foam
- compressor change to 200 B.T.U. smaller capacity
- other design changes to box to accomodate extra 1/2" of foam thickness

Results:
- decrease in kwh/mo. = 40 (approx. 39%)
- net increase in manufacturing costs of approx. $2.50/unit were added to producer selling price but didn't add margin to this increase (therefore, at 4c/kwh consumer payback will be less than one year).

Comments: Prior to ENERGUIDE, the producer was in process of automating freezer manufacturing facility to increase productivity and decrease costs of production. Coming of ENERGUIDE and fact that a competitor had introduced a 2 1/2" foam freezer (which was being heavily promoted to consumers) precipitated the decision to automate for 2 1/2" rather than 2" foamed units. Producer had determined that redesign of 2" foam unit (without going to 2 1/2" foam) would only have resulted in approx. 10% reduction in energy consumption (kwh/mo.) rating.

Producer now looks beyond cost saving benefits when contemplating product design modifications: the impact of the product changes on model energy consumption has become a heavily weighted factor in the producers' decision process.

PRODUCER: S

Case: 5

Model: Refrigerators and Freezers

Date: Past, present, future

Modification:
- went to foamed insulation cabinets in 1969, long before ENERGUIDE
- will go to 2 1/2" foam walls for freezers in 1980

Results:
- relatively low energy consumption numbers in first ENERGUIDE Directory
- expect lower energy consumption figure for freezers

Comments: Recent concern for energy consumption has influenced ongoing model design changes. ENERGUIDE has provided another benchmark (i.e., kwh/mo. rating) against which new design proposals are evaluated. This new design criteria has influenced decisions on selection of compressor and fan motors and on adaption of energy saver switches. ENERGUIDE was a catalyst to speed up drive for improved energy efficiency in models. Three to five years prior to ENERGUIDE a design modification that might have reduced energy consumption but would have increased manufacturing costs would not have been accepted. Today the trend is to incorporate energy reducing design features even if the result is a slight increase in manufacturing costs. (e.g. change to more energy efficient compressors will increase manufacturing unit cost by approx. $2. Result will be approx. 10 - 15% reduction in model's energy consumption). Competitive factors (model features and marketing practices) are also major influences over design modification decisions. (e.g. plan to go to 2 1/2" foam for freezers is reaction to major competitors' having made this modification). Anticipate that many U.S. design improvements will be adopted for Canadian models by mid 1980's, resulting in significant further decreases in fleet energy consumption.

PRODUCER: T

Case: 6

Model: 16 cubic foot refrigerator (no freezer)

Date: 1979

Modification:
- changed compressor

Result:
- expect decrease in kwh/mo. = 5 to 7 (approx. 10%)
- increase in manufacturing cost of approx $1 will result

in approx $2 increase in retail price of model (therefore, assuming 4c/kwh the 10% reduction in energy consumption will result in approx. 1 year payback on $2 increase in price to consumer).

Case: 7

Model: Freezers

Date: planned in 1977 prior to knowledge of ENERGUIDE, implemented in early 1978

Modification:
- moved from 2" to 2 1/2" foamed cabinets
- changed to more efficient compressor

Result:
- (foam change alone) decrease in kwh/mo. = 15% (approx.)
- compressor change gave further decrease in kwh/mo. = 10% (approx.)

Comments: Producer is leader in freezer manufacturing in Canada and has ongoing program of design improvements to meet needs of consumers and competitive narket place. Believes disclosure requirement (ENERGUIDE) has precipitated an industry move to 2 1/2" foamed cabinets for freezers. Producer made early move to 2 1/2" foam not because of ENERGUIDE but because of perception that the general concerns for energy were increasing in Canadian society and because it was anticipated that competitors would be making moves to improve the energy features of their models.

These case histories illustrate several important points:

- The major impact of the ENERGUIDE regulation was to speed up the introduction of energy conserving design changes by producers and to expand producers search for appropriate materials and components.

- Producers now evaluate design change options on basis of cost, competition and energy consumption factors whereas, prior to ENERGUIDE, energy consumption was not a heavily weighted design benchmark.

- Some producers, reacted to the impending implementation of ENERGUIDE and took steps to improve the energy efficiency of their models before publication of the first ENERGUIDE Directory.

- Pressures by consumers for more energy efficient appliances were not experienced and, hence, were not a motivating factor for producer moves toward more energy efficient model designs (except perhaps in the instance of Case #7).

- The energy consumption feature (kwh/mo. rating) appears to have become a point on which competing producers "position" their model offerings, i.e., competitors appear to be trying to match or out-strip each other, not only on traditional dimensions such as price and styling, but on energy consumption.

- Some energy efficient design changes result in small (e.g. $2.00) increases in direct manufacturing costs, small (if any) price increases to consumers (e.g. $6.00 max.) and, therefore, in short payback periods to consumers (e.g. a 10% reduction in a model's energy rating at 4c/kwh electric rates produces paybacks of one year or less).

- Producers have ongoing programs of model design improvements; some could make timely adjustments to energy efficiency of designs in anticipation of or coincident with ENERGUIDE; others propose to make these changes in years immediately subsequent to the implementation of ENERGUIDE when their manufacturing facilities are scheduled for relatively major modifications.

3.7 Industry-Government Controversy on Costs of Compliance With ENERGUIDE

Perhaps the most controversial issue between appliance producers (as represented by the Canadian Appliance Manufacturers Association) and the government bodies responsible for ENERGUIDE was the overall costs of the program. The purpose of this section is to present some of the discussions and data that were exchanged on this issue. The objective is not to make a definitive analysis or resolution of the controversy.

Two sets of data are presented below: The first represents the vastly different positions taken by the appliance industry association and government on costs of ENERGUIDE for refrigerators; the second is a report of a Canadian Electric Association task force which undertook to resolve the cost-benefit of the application of ENERGUIDE to ranges. The latter is presented because some of the debated cost items are the same as in the case of refrigerators and because there

was no third party analysis completed in the case of refrigerators.

3.7.1 Industry Vs. Government cost estimates for application of ENERGUIDE to refrigerators. The data tables on the next two pages were contained in a July 26, 1978 submission by CAMA (the Canadian Appliance Manufacturers Association) to DCCA (the federal government Department of Consumer and Corporate Affairs). It should be pointed out that interviews with producers did not produce unanimous consent on the accuracy and relevance of some of the cost figures in the CAMA submission. For example, some producers emphasized that additional or revised production and test facilities were planned or needed for reasons other than compliance with the ENERGUIDE regulation. On the other hand, some producers felt that ENERGUIDE was the sole cause of increased capital and other expenditures, particularly in the instance of test and production monitoring facilities and equipment. Clearly, however, there was no unanimity on the type and magnitude of incremental costs to be attributed to ENERGUIDE compliance requirements.

As indicated in the CAMA submission the major cost components for a hypothetical producer to comply with the ENERGUIDE regulation are considered to be:

- costs of building and operating a refrigerator test facility
- costs of additional production facilities
- distributor, dealer and consumer education

In total the estimated costs range from $13.38 to $102.16 per unit sold over the 1978 to 1987 period with an average figure of $56.86 (all figures are in constant 1978 dollars). When extrapolated to the total refrigerator industry the estimated costs reach over

P.35(a)

CMA Submission to DCCA

July 26, 1978

ADDITIONAL ENERGUIDE COSTS TO CONSUMER AT POINT-OF-PURCHASE 1978-1987 INCLUSIVE

i.e. additional costs incurred by individual refrigerator manufacturer and its dealers, to meet Energuide requirements

ASSUMPTIONS:

1. Hypothetical manufacturer marketing 100,000 refrigerators per year, through 100 dealers.
2. Measured in 1978 dollars (no factor for inflation).
3. Industry objective of reducing energy consumption of refrigerators by 12% in 1982 - and by an assumed 3% per year average thereafter, through to 1987.
4. Distributing/retailing mark-up conservatively estimated at 2.4 times the Energuide costs incurred at the factory.

A. ADDED TO EXISTING FACTORY COSTS

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
i addit. testing facilities: to build $150,000/100,000 5 yr amort. = .30	.30	.30	.30	.30	.30	-	-	-	-	-
to operate $120,000 annual / 100,000 = 1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
ii addit production facilities *TOOL amort. ($100,000/100,000 units/yr.)	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
iii addit. service costs (educ; 'nuisance') extra home calls (@ $20 +, each)	1.40	.35	.35	.35	.35	.35	.35	.35	.35	.35
*extra phone calls	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
iv Energuide label to produce	.10	.10	.10	.10	.10	.10	.10	.10	.10	.10
to handle	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
v Distributor/ dealer orientation $750 x 100 dealers	.75	.75	.75	.75	-	-	-	-	-	-
vi Customer educ. (booklets etc.)	.50	.50	.50	.50	.50	.50	.50	.50	.50	.50
vii Special mgmt. input (planning/org.)	1.00	-	-	-	-	-	-	-	-	-
TOTAL ADDIT. FACTORY COST = (incl 2.4 MLB factor on above, except items marked *)	13.38	9.46	9.46	9.46	7.66	6.94	6.94	6.94	6.94	6.94

B. ADDIT. COST TO RE-DESIGN REFRIG.

(inc. 2.4 MLB factor to cover dist./dealer costs)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
	-	11.20	[11.20]	(11.20)	[10.27]	[10.27]	[10.27]	[10.27]	(10.27)	[10.27]
accum.	-	-	22.40	33.60	43.87	54.14	64.41	74.68	84.95	95.22

C. ADDIT. ENERGUIDE COST TO CONSUMER

per refrigerator (incl. mfg/dist/ dealer costs)

1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
13.38	20.66	31.86	43.06	51.53	61.08	71.35	81.62	91.89	102.16

i.e. AVERAGED OVER THE 10-YEAR PERIOD, AN ENERGUIDE COST OF $56.86, PER REFRIGERATOR SOLD.

P. 35(b)

CAMA SUBMISSION TO DCCA
July 26, 1978

ENERGUIDE COST ('78 dollars)

TOTAL REFRIGERATOR INDUSTRY
(including manufacturers and retailers)
1978 to 1987, inclusive

A. SIZE OF MARKET

Estimated 600,000 refrigerators sold each year

B. ENERGUIDE COST TO INDUSTRY

Year	Cost to mfr/dealer per unit (see previous page)		TOTAL SALES per year (units)		TOTAL ADDIT mfr/retailer costs
1978	$13.38	x	600,000	=	$ 8,028,000
1979	$20.66	x	600,000	=	12,396,000
1980	31.86	x	600,000	=	19,116,000
1981	43.06	x	600,000	=	25,836,000
1982	51.53	x	600,000	=	30,918,000
1983	61.08	x	600,000	=	36,648,000
1984	71.35	x	600,000	=	42,810,000
1985	81.62	x	600,000	=	48,972,000
1986	91.89	x	600,000	=	55,134,000
1987	102.16	x	600,000	=	61,296,000
	TOTAL ADDITIONAL MFR./DEALER COSTS			=	$341,154,000

(1978-87 inclusive, in '78 dollars) or

$56.86 additional retail cost on the average, for each of the six million refrigerators sold in the decade.

C. COMPARISON OF CAMA vs. DCCA ESTIMATES

	TOTAL ENERGUIDE COST ('78-87)	AV. COST PER REFRIGERATOR (6 million units)
CAMA	$340,000,000 (addit. mfg./retailing costs, only)	$56.86
DCCA (press release May 16, 1978)	$ 36,000,000*	$ 6.00

*DCCA: "The $36 million estimated cost of the Energuide program includes the costs to manufacturers, the CSA, retailers, utilities and governments of developing and producing labels; the costs of testing by manufacturers and the CSA; the cost of labelling, administration and compliance activities; and the expense of advertisir and promotion. Over the period of the program, it works out to no more than $6.00 per refrigerator."

$341 million over the ten year period.

In contrast to the CAMA figures, the DCCA estimates are $6.00 per refrigerator sold or $36 million over the ten year period. This represents only about 10% of the costs as estimated by CAMA. The position of a third party (the Canadian Electric Association) on the relevance of similar cost discrepancies (in the case of ranges) is presented next.

3.7.2 A third party view on ENERGUIDE costs to producers. Industry and government officials agreed to have the industry's ENERGUIDE cost estimates for ranges reviewed by a task force of members of the Canadian Electric Association (CEA). Since many of the cost elements and issues are similar to those involved in labeling of refrigerators, key portions of the CEA task force report are presented in the appendix.

The highlights of the task force report are:

- Most of the CAMA cost categories have been inadvertantly overestimated. (The task force arrived at per year additional ENERGUIDE costs in the area of $2.24 to $1.46 per range sold or an average cost of $1.70 per range sold over the ten year period. These costs are only about 17% of CAMA figures which were in the area of $8.38 to $14.11 or an average of $10.16).

- In particular these CAMA cost estimates were judged to be excessive:
  - cost of additional test facilities
  - additional service costs
  - costs of distributor/dealer and consumer education
  - costs for special management input

  And these CAMA cost estimates were judged to be irrelevant to the compliance with the ENERGUIDE regulation:
  - cost of additional production facilities
  - additional costs to redesign models

- Either an independent assessment or a mutual industry-government assessment of the costs of compliance with the ENERGUIDE program should be made in order to arrive at cost estimates acceptable to both parties.

3.8 Other Producer Concerns

A variety of other producer concerns emerged both during the interviews and during the series of meetings and letter exchanges between producers (notably the CAMA organization) and government officials and agencies (notably, Canadian Standards Association and DCCA). The nature of some of the more important concerns are summarized below.

3.8.1 Location of the label. Producers and retailers argued for placement of the label inside of the refrigerator. The rationale was that if the label was on the outside it might discolor the exterior finish of the unit and/or that consumers might damage the surface (hence initiate complaints) in their attempts to remove the label. An additional point was that the relatively large label would interfere with the aesthetics of display room settings that included a refrigerator. These concerns appear to have had some influence on the ENERGUIDE regulation for refrigerators giving producers the option of label placement inside or outside the unit. All producers, in fact, placed these labels inside their refrigerators. (It is noteworthy that the ENERGUIDE regulation for freezers requires placement on the outside of the unit).

The consumer survey, presented in Part 5 of this report, measured whether consumers removed the label from their refrigerators and freezers subsequent to the unit's arrival in their homes. The results are as follows:

	Freezer Buyers	Refrigerator Buyers
% consumers who removed labels	29%	13%

Thus, placement of the label on the outside of the appliance (i.e., for freezers) results in a significantly higher removal rate than placement inside (i.e., for refrigerators). There was only one complaint noted among the 583 buyers about difficulty in removing the label.

3.8.2 In-home variance in appliance energy use. A frequently expressed concern of appliance producers is the usage related variance in appliance energy consumption. The concern is that sizeable differences exist in the manner in which householders use their appliances (hence in energy consumption) and that these differences might equal or exceed any differences in the energy consumption ratings among competitive appliance models. ENERGUIDE labels are designed to encourage choice of energy efficient appliances but the program does not address energy efficient use behaviour.

The following quotation from Consumer Reports (January 1977) illustrates the nature of the producer concern:

> Conventional wisdom: A frost-free refrigerator will cost more to operate than a manual-defrost model. That isn't necessarily so. Some of our tests comparing refrigerator-freezers of comparable size showed that there was little difference between most manual-defrosts and the more economical of the frost-free in the amount of electricity used.
>
> Even if a frost-free uses more electricity at first than the manual-defrost, once frost and ice begin to build up in the latter, its efficiency begins to drop. That loss of efficiency, together with the energy loss during the defrosting process, can sometimes wipe out the operating cost advantage of a manual-defrost.

This producer concern was not addressed in the consumer study outlined in Part 4 of this report. However, it is an important area of concern and should be treated in future research. For example, a study could be designed to monitor electrical consumption of refrigerators in actual households over an extended period. The

actual energy consumption figures could be used to answer the following questions:

- To what extent does in-home appliance energy use match energy ratings (ENERGUIDE values) produced by the standardized Canadian Standards Association test procedures?

- What is the magnitude of in-home energy use variance for similar appliance models and how does this variance compare to the variance in energy consumption (ENERGUIDE) ratings for these models.

  (e.g. Does in-home use behaviour for 14 cu. ft. manual defrost refrigerator models result in actual energy use values that meet or exceed actual usage of 14 cu. ft. frost-free models, hence nullifying the potential savings from choosing manual defrost refrigerators? Similarly, are the potential savings from choosing the most energy efficient 16 cu. ft. frost-free refrigerator nullified by actual in-home usage habits?)

3.9 Summary

The ENERGUIDE program has received the attention and, at least in part, the cooperation of Canada's appliance producers. This section has indicated that:

- Canadian producers have strong organizational ties to U.S. producers, thus there appears to be potential for the generally more energy efficient U.S. appliance designs to be incorporated into Canadian appliance production.

- Evolutionary changes in buyer tastes and competitive marketing strategies must be taken into account in evaluating the impact of ENERGUIDE on producer decision making.

- The mix of models sold by individual producers should be monitored to determine shifts in fleet energy consumption over time.

- There is evidence that producers are designing and introducing more energy efficient refrigerators due, at least in part, to the implementation of the ENERGUIDE disclosure requirement.

- Further improvements in energy efficiency of refrigerators and freezers can be expected in the near future.

- Most manufacturer and retailer brochures mention energy saving features but only rarely are actual energy consumption

ratings listed.

- There is little industry-government agreement over the costs associated with ENERGUIDE program compliance.
- Location of the ENERGUIDE label on the outside of appliances results in a higher in-home removal rate than does inside location.
- The issue of in-home variances in appliance energy use is unresolved and should be studied.

4.0 RETAILER PERSPECTIVES ON ENERGUIDE

A major component of the present study was to assess the response of major appliance retailers to the ENERGUIDE program. To this end two sets of data were obtained:

(1) Data on the changes in energy consumption of refrigerator models stocked by retailers. This was obtained from ENERGUIDE Directories for 1979 and 1980. (Results were presented in Section 3.4 and indicated that, for most retailers, at least one model stocked in 1980 had a lower energy consumption rating than a similar model size and type stocked in 1979).

(2) Data on appliance sales managers' awareness, knowledge, opinions and use of ENERGUIDE labels and energy efficiency of appliances. This was collectd via a telephone survey of retailers across Canada.

The latter set of data is the focus of this section of the report.

4.1 The Potential Role of Retailers in Consumer Appliance Purchases

The authors' earlier study of energy information at point of sale considered the extent to which consumers relied on retail sales people. Based on the particular views they expressed, consumers were segmented into three groups: Independent, Aided, and Dominated. Consumers categorized as Independent appeared to see little usefulness in the information or advice of salespeople. These views may have been due to feelings that the salesperson was uninformed and incompetent or to feelings that the salesperson's information was overly biased by self-interest.

Consumers categorized as Aided appeared to assume responsibility for making a satisfactory purchase decision but were willing to accept information from salespeople. It is conceivable that when differentiating between factual and evaluative information, these consumers adopted the stance, "Give me the facts, I'll decide what's good or bad!"

Consumers categorized as Dominated appeared to rely on salespeople not only for information, but also for a recommendation regarding which refrigerator to purchase. If a consumer had never purchased a refrigerator before and had the view that all refrigerators provide reasonable service, it would not be surprising to find that the "rational" approach was to rely on a salesperson or a retail outlet with a good reputation.

Analysis of consumers' responses regarding their experience with salespeople resulted in the following groupings:

- Independent - 44% of consumers
- Aided - 27% of consumers
- Dominated - 29% of consumers

It is clear from this data that emphasis on energy efficiency by salespeople could result in a substantial increase in sales of energy efficient appliances. In addition to the potential direct impact of sales staff, retailers can influence the energy efficiency of the appliances sold by (1) featuring energy information in point of sale displays, (2) featuring energy information in mass media advertisements, and (3) insuring the product range offered for sale includes energy efficient models. A major purpose of the retailer survey was to assess the extent to which these types of retailer activities were being initiated.

4.2 Retailer Survey Findings

In February, 1980 telephone interviews were conducted with 93 appliance retailers across Canada. Eight cities were selected to provide a geographical cross-section (Halifax, London, Quebec, Winnipeg, Montreal, Calgary, Toronto and Vancouver). Five national chains

were contacted in each city: Eaton's, K-Mart, Sears, The Bay, and Woolco. Regional chains and independents were obtained from the Yellow Pages for the cities involved. The interviews were conducted with managers in charge of major appliance sales. Bilingual interviewers were used for the Quebec City and Montreal calls.

4.2.1 The retailers in the sample. A total of 93 appliance department managers were contacted. The composition of the sample in terms of store type was as follows: 38% national chains, 22% regional chains, and 40% independents. Retailers were asked about the location of their stores and indicated the following: 40% Down-town, 19% Mid-Town, 34% Suburban, and 6% Outskirts. An indication of the size of stores that were contacted is provided by considering the number of appliance sales staff: 22% had 1 or 2 appliance sales people, 54% had 3 to 6, 17% had 7 to 12, and 7% had 13 or more.

4.2.2 Information from retailers. The questionnaire used for the telephone interviews is contained in the appendix. The results obtained are presented in detailed tables in the appendix, however, the major findings for each of five topic areas are discussed below.

(a) Do appliance retailers think consumers are interested in energy information?

To address this issue, retailers were asked what percentage of customers ask about the amount of electricity it takes to operate various refrigerators. On average, retailers felt that approximately 14% of customers ask about energy. Some of the retailers (28% of the sample) felt that the percentage of customers asking would be closer to 40%. On the other hand, other retailers (20% of the sample) felt that customers never ask about energy.

(b) Are retailers knowledgeable about appliance energy informa-

tion?

To address this issue retailers were asked three questions: which of the 15 to 16 cubic foot models stocked is most energy efficient; what is the energy rating of that model; what is the local residential electricity rate?

The results for the first question, knowing which model was most energy efficient, indicate that 27 percent of the retailers carried only one line, 36 percent cited a particular model that subsequently proved to be correct, 37 percent were incorrect or did not know.

In terms of knowing the energy rating of their most efficient 15-16 cubic foot model, only 14 percent of the retailers sampled were able to provide a correct answer. A similarly low figure (only 16 percent) could correctly provide their residential electricity rate.

(c) Are retailers incorporating energy information into their marketing activities?

To address this issue, retailers were asked questions about their sales meetings, use of printed sales aids, media advertising, and stocking of energy efficient models. Fifty-seven (57) percent said that they had discussed the use of energy information at their store sales meetings. Fifty-five (55) percent indicated that their salespeople had printed sales aids available to help customers compare energy consumption. Approximately 28 percent specifically mentioned the ENERGUIDE Directory. Others mentioned manufacturers brochures, company charts, and pamphlets from their power authority. Furthermore, these various aids appeared to be used with between 10 and 20 percent of refrigerator customers.

Responses to questions about including energy information in media advertising indicated that 23 percent had done so, with messages that discussed type of insulation, kwh consumption, percent energy saving, and general design improvements.

Finally, when asked whether they had checked the energy efficiency of refrigerators being sold by their competitors, 33 percent indicated that decisions on which models were to be stocked were made at head office, 27 percent indicated that they had checked their competitors, and 40 percent had not. Only seven (7) percent said they had specifically tried to stock more energy efficient models.

(d) What do retailers think about the ENERGUIDE program?

First, retailers were asked what percentage of their display refrigerators had ENERGUIDE labels. Surprisingly, 23 percent said that less than 80 percent were labeled. Considering that manufacturers had been labeling all refrigerators for a year and a half (at the time of the study) it is difficult to understand this apparent absence of labels. One explanation could be that some retailers are not particularly sensitive to the energy labeling program and therefore, are unaware that all refrigerators coming from manufacturers have labels. In other words, it seems possible that 23 percent of the retailers sampled are not fully aware of the ENERGUIDE program.

Second, when asked whether they felt customers could understand the labels, 53 percent said yes, 25 percent said no, and 22 percent said, "about half of the customers do".

Third, when asked what percentage of their customers consider energy information to be a key factor in their refrigerator

purchase, fifty-eight (58) percent of retailers surveyed felt that none of their customers consider energy; 22 percent felt that up to ten percent of their customers consider energy; and 20 percent felt that closer to 30 percent of refrigerator buyers consider energy to be a key deciding factor.

Fourth, retailers were asked where they would prefer energy labels to be located. Sixty-five (65) percent preferred labels on the inside of refrigerators, 29 percent preferred on the outside of the door, and 6 percent had other suggestions.

Fifth, retailers were asked whether other major appliances should be labeled. Eighty-seven (87) percent said yes, 13 percent said no.

Sixth, retailers were asked whether they had received the ENERGUIDE retail display package. Thirty-six (36) percent indicated that they had, 28 percent had set up the display, and 13 percent indicated that they used the display at least occasionally in sales talks with customers.

Finally, when asked whether government should do more or less promotion of appliance energy information, 65 percent said more, 16 percent said less, and 19 percent felt the current level was adequate.

(e) Do retailers' responses differ by type of outlet or by geographic location?

Due to the limited nature of the sample caution is required in drawing conclusions regarding differences by geographic region. However, careful analysis suggests the following:

- For several topics, retailers in Quebec and Calgary seemed less interested in energy information, while retailers in Halifax were relatively more interested.

- Independent retailers appeared to be less sensitive to and less committed to the use of appliance energy information.
- Finally, retailers east of Ontario appeared less aware of the ENERGUIDE program, particularly in terms of awareness of the ENERGUIDE retail support package.

4.3 Summary

Retailers, particularly retail salespeople, exert considerable influence on consumers' decision processes for major appliances. If energy efficient models are stocked and emphasized to consumers in sales presentations and other point-of-sale or mass media promotions, the chances of their being chosen by consumers increases. The extent to which retailers encourage energy efficient appliance choice was addressed in a survey of 93 appliance department managers across Canada and revealed that:

- Few consumers ask about appliance energy consumption.
- Retailers often could not correctly identify their most energy efficient refrigerator model in a given size and style category.
- Only about one-half of appliance department managers have emphasized energy consumption information in their sales meetings and only about one-sixth of sales presentations to customers have had this emphasis.
- About one-fifth of retailers have media ads that include energy information.
- Though most retailers feel ENERGUIDE should be extended to other major appliances, there is no majority consensus on a number of other specific ENERGUIDE related issues.
- Comparisons by region and store type indicated only limited variations.

5.0 CONSUMER SURVEY

A study done at the outset of the ENERGUIDE program, October 1978, evaluated the initial impact of ENERGUIDE labels (Anderson and Claxton, 1979). This earlier work involved a field experiment that studied household refrigerator purchases in terms of the impact of energy labels and the importance of retail sales staff. One aspect of this study was a survey of 300 households in Western Canada that had purchased a new refrigerator in the fall of 1978. The survey questionnaire covered a range of areas including the following.

- Description of the new refrigerator in terms of size, brand, model, etc.
- Importance ratings for various refrigerator attributes, such as purchase price, product features, operating costs, etc.
- Importance of salesperson's advice.
- Attitudes and knowledge regarding energy issues.
- Awareness, understanding and usage of ENERGUIDE labels.

The purpose of the current study was to replicate the 1978 survey two years later, and to focus on the following objectives:

(1) To assess the impact that ENERGUIDE labels are currently having on consumers buying refrigerators or freezers.

(2) To assess the trend in ENERGUIDE label impact by comparing current survey findings with the survey done in 1978.

5.1 Methods

The major problem associated with the consumer survey was to obtain a national sample of households that had recently purchased a refrigerator or freezer. The method adopted was to re-contact the retailers involved in the retailer survey (described in Part 4 of this report), and request a list of recent refrigerator and freezer customers. Specifically, 93 retailers in eight citites were asked to provide a complete listing of customers that had purchased a refrig-

erator or freezer during October or November of 1980.

Customer lists were provided by independent, chain and department type appliance stores. These lists were stratified by city and by type of retail outlet. A random sample of 1467 households was selected from the stratified list. Each household was mailed a questionnaire with a stamped self-addressed return envelope.

A total of 586 households completed the questionnaire, a response rate of 40 percent. The number of respondents and response rates by city are indicated below.

City	Respondents	Response Rate
Vancouver	69	36%
Calgary	34	53%
Winnipeg	149	42%
London	111	44%
Toronto	45	32%
Montreal	99	35%
Quebec	23	30%
Halifax	56	48%
TOTAL	586	40%

It was clear that a truly random sample would not be obtained from either the sampling method used, or any of the alternatives considered. On the other hand, the current sample certainly does indicate the shopping experiences of a reasonably large number of Canadians from coast to coast. As such, it suggests the impact that the ENERGUIDE labels are having on appliance purchases.

The questionnaire used for the consumer survey was largely a replication of the 1978 instrument. The topics covered were indicated

earlier in this section. Both French and English versions of the questionnaire were utilized. An example questionnaire is provided as an appendix.

5.2 Findings

Analysis of the consumer survey data is summarized in Tables 5.1, 5.2 and 5.3 of this section of the report. These tables compare refrigerator buyers with freezer buyers, and also compare 1978 consumer data with the current study. Because the 1978 study was restricted to refrigerator purchases in western Canadian cities, a corresponding subsample of 1980 refrigerator buyers was used for trend comparison. A detailed breakdown of the 1980 findings by store type and by city is contained as an appendix.

What products were purchased? As indicated in Table 5.1, the responses of the 250 refrigerator buyers indicated that the average size of refrigerator was 14.5 cubic feet, 16 percent were manual defrost, and the mean electricity consumption rating was 137 kwh per month. Trend comparisons with 1978 data indicated a substantial increase in the proportion of manual defrost, up from 9 to 17 percent. Correspondingly, the average size and kwh rating indicated a decline.

Another comparison of interest between 1978 and 1980 refrigerator buyers was that 25 percent (versus 21 percent in 1978) indicated consideration of manual defrost. In other words the percentage considering manual increased from 21 to 25, while the percentage choosing manual increased from 9 to 17. A much higher proportion of the people considering manual defrost ended up choosing it.

The responses from 336 freezer buyers indicated an average size

Table 5.1

APPLIANCES PURCHASED & PURCHASE CRITERIA

Measure	1980 Consumer Survey		Western Canada Comparisons	
	Refrigerators	Freezers	1978	1980
Sample Size:	250	336	303	100[1]
Appliances Purchased:				
. Average size (cu.ft.)	14.5	11.7	15.0	14.3
. Percent manual defrost	16%	NA	9%	17%
. Average kwh rating	137	75	146	141
. Percent of households considering manual defrost	25%	NA	21%	25%
Householders' . Estimated life of new appliance	15 yrs	14 yrs	15 yrs	15 yrs
Householders' . Estimated annual operating cost	$64	$44	NA	$63
Purchase Criteria (Rank Order of Importance):				
. Type of defrost	1	8	1[2]	2
. Warranty	2	1	2	3
. Total storage capacity	3	2	3	1
. Number & type of shelves	4	10	5	5
. Colour	5	12	4	4
. Low price	6	4	7	6
. Operating cost	7	3	11	8
. Dual temperature controls	8	11	6	7
. Brand name	9	7	10	9
. Type of insulation	10	5	8	10
. Interior wall construction	11	6	9	10
. Thin-wall construction	12	9	12	12
. Ice maker	13	13	13	13

[1]Because the 1978 study focused on refrigerator purchases in Western Canadian cities, a corresponding subsample of 1980 refrigerator buyers was used for trend comparisons.

[2]In 1978 a total of 19 purchase criteria were rated. Only 13 of the 19 product attributes were common between the 1978 and 1980 research instrument, hence the rank orders for 1978 are adjusted accordingly.

of 11.7 cubic feet, and an average kwh rating of 75.

What was the estimated operating cost? Consumers were asked to estimate the annual electricity cost for their new appliances. The mean estimate for refrigerator buyers was 64 dollars; the mean for freezer buyers was 44 dollars (Table 5.1). Since the mean ratings of the new appliances were 137 and 75 kwh per month, the estimated operating costs should have been closer to 50 and 26 dollars, respectively, per year (assuming an average kwh cost of 3 cents). Consumers appear to be overestimating annual operating costs by a substantial margin.

What were the major purchase criteria? Consumers were asked to indicate the importance of a list of product attributes, using a 5-point scale ('Not at all important' to 'Extremely important'). Details of these ratings are provided in the appendix. As indicated in Table 5.1, refrigerator buyers consider type of defrost, warranty, storage capacity, shelving and colour to be the five most important criteria. This top group was unchanged from 1978. Operating cost shifted from eleventh of 13* in 1978 to eighth of 13 in 1980.

For freezer buyers, the top five criteria were warranty, storage capacity, operating cost, price, and type of insulation. Industry people have suggested that freezers are more of a commodity-type of product, and hence utilitarian rather than cosmetic attributes have more importance.

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*Actually the rank was 15th of 19 in 1978. However, the 1978 rank was adjusted and is based on the same 13 purchase criteria as used in 1980.

What shopping was done? As has been indicated by other research, appliance buyers reported a relatively low degree of deliberation and comparative shopping. For both refrigerator and freezer buyers over 40 percent considered only one brand, over 50 percent considered only one size, and approximately 40 percent visited only one store (Table 5.2). This low degree of deliberation was in spite of the fact that there were 30 percent first-time-buyers for refrigerators and 70 percent first-time buyers for freezers.

How influential were retail sales staff? Respondents were asked if "salesperson's advice was very important" in their product choice. It is probable that this type of question is subject to response bias. That is, consumers are likely inclined to understate the influence of commercial sources of information. Even so, over 30 percent of the sample indicated that a salesperson was a major factor in determining the product purchased (Table 5.2).

What about energy attitudes? Two questions were used to assess general concern for energy issues. Respondents were asked if they were aware of their residential electricity rate. As indicated in Table 5.2, almost 75 percent did not, with no change indicated between the 1978 and 1980 surveys. Second, respondents were asked if they considered energy shortage to be a serious national problem. Approximately 37 percent did, with no change indicated between 1978 and 1980. In general, concern about energy appeared to be only modest, and had not increased over the past two years.

Did appliance buyers notice the ENERGUIDE labels? Seventy-four percent of refrigerator buyers and 83 percent of freezer buyers reported seeing ENERGUIDE labels while shopping. The higher percentage

Table 5.2

SHOPPING PATTERNS

Measure	1980 Consumer Survey		Western Canada Comparisons	
	Refrigerators	Freezers	1978	1980
Sample Size:	250	336	303	100[1]
Shopping Patterns:				
. Percent considering only one brand	42%	52%	47%	44%
. Percent considering only one size	51%	51%	54%	52%
. Percent considering only one store	39%	48%	39%	39%
. Percent indicating salestaff advice a major factor in choice	29%	32%	29%	37%
. Percent unaware of domestic electricity rate	74%	73%	80%	80%
. Percent considering energy shortage to be a serious national problem	36%	38%	30%	31%

[1]Because the 1978 study focused on refrigerator purchases in Western Canadian cities, a corresponding subsample of 1980 refrigerator buyers was used for trend comparisons.

for freezers could have been due to label prominence (on the outside lid of freezers and on the inside for refrigerators). It was encouraging to note that the percentage noticing the labels had more than doubled between the 1978 and 1980 surveys (Table 5.3).

Did salespeople comment on labels? For approximately 12 percent of appliance buyers label awareness was the result of a salesperson pointing out the labels. Further, one third of the sample had the labels explained by a salesperson.

What did consumers think of the labels? Over 60 percent thought that the labels were understandable, up from 25 percent two years earlier. Approximately one third thought that there were significant differences in kwh ratings across models. The proportion of buyers considering kwh rating to be a major factor in their choice was 29 percent for refrigerators and 43 percent for freezers. Further, comparison of the 1978 and 1980 surveys indicated 100 percent increase in the proportion of buyers giving serious consideration to the ENERGUIDE ratings.

Were there labels on the appliances when delivered? A surprising 25 percent for refrigerators and 18 percent for freezers indicated no label on the appliance arriving in the home (Table 5.3). One explanation considered was that these represented models for which consumption testing had not been completed. Subsequent analysis of the models purchased by survey respondents indicated that only 1.5 percent were models not included in the ENERGUIDE Directory. Another explanation considered was that consumers were mistaken. However, two factors made this conclusion seem unlikely. First, the labels are difficult to remove and thus the consumer was not likely to for-

Table 5.3

ENERGUIDE LABEL IMPACT

Measure	1980 Consumer Survey		Western Canada Comparisons	
	Refrigerators	Freezers	1978	1980
Sample Size:	250	336	303	100[1]
Label Impact:				
. Percent noticing labels	74%	83%	33%	77%
. Percent where salesperson pointed out labels	13%	12%	6%	12%
. Percent where salesperson explained labels	30%	39%	12%	29%
. Percent thinking label is understandable	61%	68%	25%	62%
. Percent thinking kwh ratings are significantly different across models	26%	37%	20%	24%
. Percent indicating no label on delivered appliance	25%	18%	NA	29%
. Percent considering kwh rating a major factor in choice	29%	43%	10%	22%

[1]Because the 1978 study focused on refrigerator purchases in Western Canadian cities, a corresponding subsample of 1980 refrigerator buyers was used for trend comparisons.

get removing the label. Second, the questionnaire was being completed in the home, possibly on the kitchen table. Accordingly, any doubt about the label presence could easily be checked by looking in the refrigerator. It appears that other explanations for absence of labels need to be sought.

5.3 Summary

The general picture obtained from survey responses was that a substantial proportion of refrigerator and freezer buyers saw the ENERGUIDE labels (74% and 83%). Over 60 percent considered the labels understandable. Finally, a major segment reported that kwh rating was a major factor in the purchase selection (29% for refrigerators; 43% for freezers).

Comparison of refrigerator versus freezer buyers indicated that the latter group was more aware and made greater usage of the ENERGUIDE labels. Furthermore, comparison of 1980 versus 1978 consumer data indicated a marked increase in awareness and usage of ENERGUIDE labels. A parallel trend was noted in the proportion of manual defrost models. With manual defrost increasing from 9 to 17 percent of refrigerator purchases, there was a clear behavioral shift to greater energy efficiency.

6.0 SUMMARY AND CONCLUSIONS

6.1 Background

In October 1978 Canadian manufacturers began placing ENERGUIDE labels on refrigerators. Concurrently research was started to help evaluate the impact of the ENERGUIDE program. The initial study, a field experiment, assessed the effect of energy lables both with and without retail salestaff support. The field experiment was conducted in October and November, 1978, in 18 stores across Western Canada, and was followed by a questionnaire asking refrigerator buyers about their purchase and their attitudes regarding the energy labels. The results of this initial study were first presented in a report to the Department of Consumer and Corporate Affairs in March 1979. Further analysis of the data was presented in a follow up research paper which was subsequently included in the proceedings of the International Conference on Consumer Research and Energy Use, Banff, 1980.

The initial report covered (1) the magnitude of energy savings that could result from the ENERGUIDE program, (2) consumers' reaction to the labels, (3) sales staff reaction to the labels, (4) the significance of retail sales staff in refrigerator purchase decisions, and (5) the probable impact of various program management initiatives that could be used to increase ENERGUIDE effectiveness.

The recommendations put forward by the initial report dealt with future research and priorities for ENERGUIDE program management. The research recommendations were summarized:

> ... ongoing management of the ENERGUIDE program could be served by two major types of research. Periodic collection of industrial unit sales figures would indicate overall trends in refrigerator energy consumption. Second, diagnostic surveys using trained shoppers and consumer interviews would indicate the ef-

fectiveness of specific management initiatives.

Although the study presented in the present report address the second type of research, collection of manufacturers' unit sales data was not adequately covered and remains a valuable option for future research efforts.

The priorities for ENERGUIDE management that were suggested by the initial report were summarized:

- Place primary emphasis on informing retail salespeople on the interpretation and utilization of ENERGUIDE labels.
- Provide retail salespeople with a sales aid that they can use to show customers: (1) how label information can be converted to operating costs, and (2) how models on display compare.
- Provide consumers with an information pamphlet that explains how to compare refrigerators in terms of operating costs. (Pamphlets should be available at point of sale).
- Require placement of ENERGUIDE lables on the outside of the refrigerator door.

Program efforts have subsequently addressed the first three of these priorities, and the fourth in that labels on freezers are on the outside. Review of the present study indicated that clear progress in terms of label impact has been achieved. However, continued efforts in similar priority areas remains appropriate. This point will be returned to later.

The supplementary paper that followed the initial report (see appendix) drew attention to the market segment where ENERGUIDE labels had had most impact. Consumers buying refrigerators in the 10 to 14 cubic foot range (where manual defrost was a viable option) were identified as most receptive to energy information. In the 1978 experiment, the proportion of manual defrost units purchased by this group was 0.54 with labels present, compared to 0.27 with labels ab-

sent. The current study reconfirms the significance of energy labels to the segment considering both manual and frost-free models.

6.2 Summary of Current Findings

A study of Canada's appliance producers was presented in Part 3 of this report and was summarized as follows:

- Canadian producers have strong organizational ties to U.S. producers, thus there appears to be potential for the generally more energy efficient U.S. appliance designs to be incorporated into Canadian appliance production.
- Evolutionary changes in buyer tastes and competitive marketing strategies must be taken into account in evaluating the impact of ENERGUIDE on producer decision making.
- The mix of models sold by individual producers should be monitored to determine shifts in fleet energy consumption over time.
- There is evidence that producers are designing and introducing more energy efficient refrigerators due, at least in part, to the implementation of the ENERGUIDE disclosure requirement.
- Further improvements in energy efficiency of refrigerators and freezers can be expected in the near future.
- Most manufacturer and retailer brochures mention energy saving features but only rarely are actual energy consumption ratings listed.
- There is little industry-government agreement over the costs associated with ENERGUIDE program compliance.
- Location of the ENERGUIDE label on the outside of appliances results in a higher in-home removal rate than does inside location.
- The issue of in-home variances in appliance energy use is unresolved and should be studied.

A study of appliance retailers was presented in Part 4 of this report and was summarized as follows:

- Few consumers ask about appliance energy consumption.
- Retailers often could not correctly identify their most energy efficient refrigerator model in a given size and style

category.

- Only about one-half of appliance department managers have discussed energy consumption information in their sales meetings and only about one-sixth of sales presentations to customers have had this emphasis.

- About one-fifth of retailers have media ads that include energy information.

- Though most retailers feel ENERGUIDE should be extended to other major appliances, there is no majority consensus on a number of other specific ENERGUIDE related issues.

- Comparisons by region and store type indicated only limited variations.

- 36 percent had received the ENERGUIDE retail display and 13 percent had used it when talking to customers.

- 28 percent had copies of the ENERGUIDE Directory available for use with customers.

- While 65 percent preferred no change in label location, 29 percent preferred moving the label to the outside of the door.

The study of consumers was presented in Part 5 of this report and was summarized as follows:

- 74 percent of refrigerator buyers and 83 percent of freezer buyers reported seeing ENERGUIDE labels when shopping for their appliances.

- Over 60 percent considered the labels to be understandable.

- 29 and 43 percent of refrigerator and freezer buyers, respectively, indicated that kwh rating was a major factor in their purchase choice.

- Freezer buyers were more aware and made greater use of energy information than refrigerator buyers.

- Comparing the 1978 and 1980 consumer surveys label awareness increased from 33 to 77 percent, label usage increased from 10 to 22 precent, and purchase of manual defrost increased from 9 to 17 percent.

6.3 Unanswered Questions

There are a number of issues that remain to be addressed.

First, no attempt has yet been made to monitor appliance sales patterns across the country. Manufacturers could supply unit sales figures by model and region. This would enable assessment of energy efficiency trends.

Second, a remaining concern is whether in-home appliance usage patterns nullify initial differences in appliance efficiency ratings. This is particularly troublesome in the case of refrigerators where there is a concern that manual defrost may lose its advantage over frost-free if refrigerator defrosting habits are not systematic. Collection of in-home electricity consumption data for a stratified sample of refrigerators would help address this issue.

Third, a concern was identified regarding the apparent absence of labels on appliances delivered to the home (25 percent missing for refrigerators, 18 percent missing for freezers). An audit of a national sample of retail outlets would provide insight in this area.

Fourth, the retail audit suggested above would also make it possible to continue to improve the ENERGUIDE materials aimed at supporting retailers. Although the ENERGUIDE retail display and directory has enjoyed reasonable success, it continues to be important to understand (1) are there other support materials that retailers would find more useful, and (2) are there other methods of effectively disseminating retail support materials.

Finally, a somewhat disconcerting finding was that a substantial majority of consumers (70 percent) did not feel that the differences in efficiencies across models were significant. One explanation for this finding is that consumers carefully studied many models, and reached the conclusion that the differences were not worth worrying

about. A second explanation is that consumers had only a vague impression as to efficiency differences because they had been more interested in other product features. Accordingly, when asked for their impressions of differences, they tended to rationalize their lack of knowledge by saying the differrences were not significant. Future consumer research would do well to focus on (1) the extent to which consumers understand energy labels, and (2) methods that could be used to improve consumer energy knowledge.

6.4 Conclusions

At a general level the conclusions that flow from this research are: (1) ENERGUIDE labels are gaining a satisfying level of consumer awareness and interest, (2) therefore, continued commitment to the ENERGUIDE program seems entirely justified, and (3) the planned expansion of the labeling program to other major appliances has the strong support of both consumers and retailers (94 and 87 percent respectively favor labeling all major appliances).

At a more specific level attention should be focused on continuing to improve both consumer and retailer interest in appliance energy efficiency. First, with respect to consumers there remains a major segment that may not fully appreciate the differences in energy efficiency from model to model. For example, 74 percent of refrigerator buyers and 63 percent of freezer buyers could not recall seeing significant differences. Only 8 percent of the sample had seen a copy of the ENERGUIDE Directory. This does not imply the need for a mass media campaign to better educate all consumers. Rather resources might well be directed at informing those consumers who are about to purchase a major appliance. An obvious method of communica-

ting with this group is by having booklets and displays at the point of sale. In addition attempts should be made to find ways of identifying households that are changing their place of residence. For example, it might be possible to work in cooperation with moving companies, real estate firms, the post office or utilities. Each of these organizations is aware of when households are moving, an activity most frequently associated with the purchase of new appliances.

Finally, increasing retailer interest and support continues to be a priority for future energy program efforts. Although 36 percent of the retailer sample reported that they had received the ENERGUIDE display package, only 13 percent indicated using the display in discussions with customers. Only 14 percent could correctly provide the ENERGUIDE rating of their most efficient mid-size model. Only 16 percent knew their residential utility rate. Only 28 percent had a copy of the ENERGUIDE Directory.

Future efforts to achieve the cooperation of retailers are most likely to succeed if careful attention is given to retailers' usual interests and practices. For example, retail sales people frequently are paid on a commission basis. As a result they may perceive energy efficiency to be counter to their personal interests. That is, energy efficient models are often smaller and less expensive, resulting in smaller sales commissions.

However, energy efficiency is not always associated with cheaper models. Retail sales staff would be interested in a message such as, "trading up to energy efficiency." An example from the Sears 1981 Spring and Summer catalogue (Vancouver region) illustrates this message. The least expensive 15 cubic foot freezer in this catalogue

sells for 370 dollars and costs 44 dollars per year to operate (at 4 cents per kwh). The more expensive models of the same size sell for 415 and 440 dollars, and both cost 28 dollars per year to operate. A sales person could demonstrate that a consumer's energy savings would pay for the mid-priced model in less than 3 years, and pay for the most expensive model in less than 5 years. In summary materials sent to retail outlets should emphasize examples of "trading up to energy efficiency".

A second approach that would both (1) increase the prominence of energy information and (2) fit with usual retail practices, would be to recommend the use of life cycle cost sales tags. Retailers could be provided with examples of appliance sales tags such as the one illustrated below:

MODEL
PRICE:
10 YEAR ELECTRICITY OPERATING COST:

In summary, approaches that are tailored to retailer interests and practices are critical to expanding the impact of the ENERGUIDE program. The two suggestions provided here ("trade up to energy efficiency", and life cycle cost sales tags) are intended only as examples. Before selecting a specific approach, administrators of the ENERGUIDE program would be well advised to spend time in discussions with major retailers. Furthermore, future program efforts that are focused on retailers should be implemented by personal contact between ENERGUIDE representatives and retailers. This is particularly important in the case of national retail chains.