ENERGY CONSUMPTION AND

LOW INCOME HOUSEHOLDS IN CANADA

EXECUTIVE SUMMARY

Final Report: September 1984

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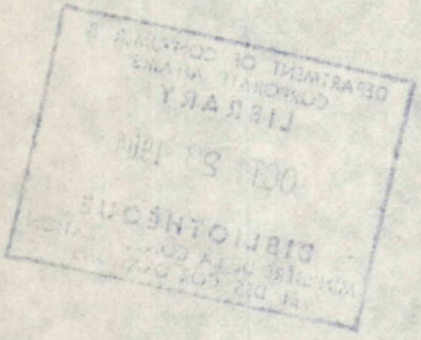

LOW INCOME PEOPLE AND ENERGY CONSUMPTION

EXECUTIVE SUMMARY

Introduction

Low income families in Canada have been recently described as "Canada's Forgotten Poor."[1] Whether or not this description is accurate in general, it does seem to be an accurate description of the lack of concern for low income people in the energy area. While agencies in other countries[2] have developed programs to help low income families with household heating expenses, in Canada major initiatives of this type have not been developed.

Concern regarding this problem led the Canadian Department of Consumer and Corporate Affairs to initiate the research described in this report. The intention was to take a closer look at existing data with the purpose of providing an initial interpretation of the energy expenditures of low income Canadian households and of governmental policies that influence such expenditures.

For example, government energy policy has included deliberate increases in energy prices. Has this created a particular hardship for low income families? What have these families done to adapt to these rising prices? Government conservation programs have attempted to help householders reduce energy expenses through encouraging conservation actions including home insulation, providing information on energy efficient products, and setting automobile gasoline efficiency standards. Have these programs helped those with low incomes compensate for the pressure caused by higher energy prices?

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1 Maclean's; cover story, "Canada's Forgotten Poor," January 30, 1984, pp. 14-23.

2 For example, The Citizens Energy Corp., Boston, U.S.A., has been established to help low-income consumers save on their heating bills. The National Right to Fuel Campaign, Bradford, U.K., is promoting the "Cost of Warmth Index" to measure levels of fuel poverty experienced by low income families.

The focus of the present research was on questions of this type. As the study was being formulated it appeared that there were a number of data sets that might be helpful. Accordingly, the decision was that an appropriate beginning would consist of an analysis and interpretation of existing data.

THE DATA

Three major data types were used to analyze the low income and their energy consumption.

Statistics Canada Data was used to obtain a description of low income households in Canada. This description included family demographics, geographic characteristics, housing, appliance and automobile ownership, and also expenditure patterns for housing and transportation.

The second data set consisted of household surveys commissioned by the Canadian Department of Consumer and Corporate Affairs, in particular a survey of household Energy Consumption and Conservation Patterns. This survey investigated all of the major household energy types of energy consumption in addition to conservation attitudes and behaviors. The series of Wave attitude surveys was also considered.

The final data set consisted of a series of three studies of specific government programs. A study of the Energuide program provided an indication of the approach used by low income households when purchasing major appliances. Evaluations of CHIP and COSP provided indications of the receptiveness of low income households to government conservation subsidies.

WHAT IS LOW INCOME?

Prior to analyzing the various data sets it is important to consider the term "low income." The rationale for looking at low income families is the

implication that they are facing an unhappy situation as a result of economic hardships. However, the analytical problem is that low income, as indicated by a measure such as "annual family income", is not entirely equivalent to economic hardship. In other words, an income of $10,000 per year for family with three children between 1 and 7 years living in a Montreal apartment, is undoubtably not equivalent to $10,000 per year for a retired couple living in a mortgage-free cottage in the suburbs of Victoria.

The method employed by Statistics Canada to produce more equivalence across households is to identify the point at which individuals and families spend 58.5% of their income in 1982 on food, shelter and clothing. This has been found to depend mostly on family size and city size. For example, a family of four living in a rural area with an income below $14,110 would usually spend more than 58.5% on the three basics. The same size family in a big city would spend more than 58.5% unless its income was at least $19,180. To state this another way, families with higher incomes tend to spend a lower proportion of their income on the three basics. As incomes drop below a certain point, referred to as the "low income cutoff" (LICO), more than 58.5% is likely to be spent on food, shelter and clothing.

For the research reported here, "low income" was analysed in two ways. Wherever the data allowed, households were segmented into those below and those above the LICO. Secondly, where possible, households were also segmented into employed-retired to account for possible differences in spending patterns (e.g., living in mortgage-free homes) and needs.

OVERALL SUMMARY AND CONCLUSIONS

The following summarizes the analysis of Statistics Canada data, CCA surveys, and three conservation program studies. Conclusions are presented with regard to: a) main themes in energy consumption by the low income; b) energy program priorities; and c) future research directions.

Summary - Statistics Canada

How many people living in Canada have annual incomes that are less than the LICO (Statistics Canada's Low Income Cut Offs)?

- In 1978 the Canadian population was made up of 5.8 million "family" households (multiple persons) and 1.3 million "unattached" households (single persons). Of the family households 11% (637,000 Households) had incomes below LICO. Of the unattached 36% (470,000 households) were below LICO. In 1982 12% of families and 38% of unattached had incomes less than LICO.

Who are the people below LICO: the elderly? less educated? households without male wage earners? single mothers? larger families? in big cities? in particular regions?

- The answers to all of these suspicions seems to be "yes but no". It is important to retain the family-unattached distinction since there are differences between these two groups.

- For families below LICO roughly 25% are over 65 years of age (compared to 12% for families above LICO). The converse is that the very large majority have not reached retirement age.

- Approximately 33% of low income families have a female household head (compared to less than 10% for families above LICO). On the other hand, two-thirds of below LICO families have male household heads.

- More than 40% of low income families have less than 8 years education. The converse is that at least 10% have more than 12 years.

- The size of the family and the city size do not seem to differ for families below versus above LICO. On the other hand regional differences in percentage of low income families match the general pattern of regional prosperities.

- For the unattached below LICO the difference in age is much more pronounced with close to 50% being over 65 years (compared to roughly 20% for unattached above LICO).

- The female-male ratio is 65:35 (compared to 50:50 for above LICO).

- More than 40% have less than 8 years of education.

- Again there appears to be little distinction by city size, and regional differences match regional prosperities.

What is the housing situation of households below LICO?

- For families below LICO a major characteristic of their housing is that approximately 1/2 are renters. As discussed later this large proportion of renters has two major implications when consider low income and energy issues. First, renters frequently have their heat and light costs included as part of their rent making analysis of these expenses difficult. Second, government conservation programs have, for the most part, been directed at homeowners. This indicates that over 1/2 low income families are unlikely to benefit from these programs.

- Other housing characteristics of families below LICO indicate that their homes are somewhat older and somewhat smaller.

- For unattached below LICO the proportion renting is even higher. More than two-thirds are renters. Their homes are also somewhat older and smaller.

Do households below LICO own fewer appliances?

- Lack of information on renters complicates this question. Rental accommodation frequently provides stoves and refrigerators, possibly washers, dryers, and occasionally dishwashers. Since there are many renters among low income families, there will be the natural outcome of lower appliance ownership.

- For families below LICO the percentage that own major household appliances is consistently lower than for families above LICO. However, it is important to note that the lower appliance ownership among the lower income corresponds to

their higher incidence of living in rental accommodation. In other words, ownership of major appliances per homeowner does not appear to differ much with income.

- For unattached below LICO the proportion of homeowners that owned these major appliances is consistently lower.

Do households below LICO own few automobiles?

- For families below LICO the answer is definitely yes. Approximately 40% own no car (compared to only 10% non owners among the above LICO).

- For unattached below LICO car ownership is even less common, almost three-quarters own no car.

Are low income families able to keep their expenses, particularly energy expenses, in line with their incomes?

- As mentioned earlier, information on energy expenses for renters is problematic since heat and light is frequently included in their rent. Statistics Canada's "Shelter Expense" is the only data that includes all households, and is a summation that includes rents, mortgage interest, electricity bills, maintenance, and whatever else householders pay for their shelter. Comparison of low versus high income households indicates that the low income are not able to keep these shelter expenses in proportion to their incomes. That is, low income families spend a higher fraction of their incomes on shelter.

- For low income families total expenditures are 33% the spending of high income families, however their shelter expenses are close to 50% of the higher income.

- For low income unattached total expenditures are 25% of spending of the higher income, while shelter is again close to one-half.

- Among households that pay for heat and light directly, it is clear that keeping energy expenses in line with income is a major problem.

- Low income families spend roughly 80% as much as high income families for heat and light, while their total expenditures are only 33%.

- Low income unattached spend essentially the same as high income, while their total expenditures are only 25%.

- On the other hand low income households cut their automobile driving by more than would be indicated by their income level. Low income families spend 28% as much as high income families on gasoline, while their total expenditures are 33%. Low income unattached spend only 15% as much as those with higher income on gasoline, while their total expenditures are 25%.

Summary - CCA Surveys

The ECCP research done by CCA made it possible to look specifically at family homeowners -- the target of many conservation programs. This data also made it

possible to segment family homeowners into employed and retired, based on the supposition that low income retired are a special case in that their low retirement incomes may be offset by accumulated equity.

Analysis of the ECCP data indicated that the demographics of low income family homeowners were not substantially different from Statistics Canada's families below LICO. Attention to low versus high income in the employed segment indicated several differences -- a tendency of low income toward larger families, lower education, older homes, the same number of cars but more cylinders, and less miles driven but the same level of gasoline usage.

What are the attitudes of the low income regarding energy conservation?

- Although attitudinal differences were not major, these differences displayed a clear pattern that was divisible into "low income effects" and "retirement effects".

- The differences between low versus high income families indicated that the low income were more skeptical -- more inclined to view the energy issue as a fad, to think government was spending too much on conservation, to resent being asked to conserve more, and to blame business for energy problems.

- The differences between retired and employed families indicated that the retired were more positive toward conservation -- more inclined to consider conservation important, to read a lot about the topic, to believe people will have to do more, to agree that laws would be effective in attaining conservation, and to agree that there should be greater use of public transit.

Have low income families tried to cut their energy consumption?

- Again the ECCP data displayed separate "low income" and "retirement" effects".

- Low income families had fewer appliances, more likely owned a manual defrost refrigerator and manual lawn mower, more likely to hang clothes to dry, to wash clothes in cold water, and more likely to have reduced their hot water setting.

- Retired families also had fewer appliances and were more likely to hang clothes to dry. They were also more likely to close off rooms in the winter, but were less likely to use cold water to wash clothes.

- On balance the low income are making many attempts to reduce their energy consumption. Further, these efforts are amplified when the low income family is retired.

Among family homeowners are those with low incomes able to keep their energy expenses in line with their incomes?

- A major contribution of the ECCP data was the segmentation of employed and retired in the analysis of energy expenditures. This segmentation showed that lower levels of energy spending by low income families were limited to families in the retired segment.

In other words, retired family homeowners with low incomes spend less on electricity; fuel and gasoline than their higher income counterparts.

- Among employed families homeowners spending on electricity, fuel and gasoline does not change with income.

- Attention to factors associated with energy consumption helped to provide an understanding of these energy spending patterns. For example, for in-home energy each of the four income-employment segments was evaluated to identify characteristics that would lower energy expenditures.

- High income Employed -- newer houses possibly more energy efficient, but offset by more rooms and more appliances -- "high" consumption.

- Low income Employed -- many small conservation actions, but offset by larger families -- "high" consumption.

- High income Retired -- small families, close off rooms in winter -- "moderate" consumption.

- Low income Retired -- smaller families, fewer rooms, fewer appliances, close offrooms in winter, many small conservation actions -- "low" consumption.

Summary - Conservation Program Studies

Research focusing on three conservation programs (CHIP, Energuide and COSP) was analysed to assess the reaction of low income households to government

conservation initiatives. Since each program involves a cash outlay on the part of the householder, it was maybe not surprising to find that these programs were used less by the low income than by households with higher income levels.

Does the Canadian Home Insulation Program, CHIP, Serve the Needs of Low Income Households?

Since the information available for analysis was not the complete CHIP evaluation data set, the conclusions are tentative. However, the pattern that emerged from the available data was very interesting and indicated the need for further attention to the complete data set. Preliminary analysis showed the following pattern:

- Low income households were more inclined to feel knowledgeable about conservation

- Low income households reported as many conservation actions as those with higher incomes

- Low income households were more inclined to feel insulation is not affordable

- Low income households were less aware of CHIP

- Low income households were less likely to have used CHIP

As indicated earlier renters are a major segment of low income households. Although CHIP is available to renters, presumably there is less incentive for

this group to add insulation. The success of CHIP in assisting low income renters should be of particular concern in future program analysis.

Does the 'Energuide' Program Serve the Needs of Low Income Families?

The data for the Energuide research was from a sample of refrigerator and freezer buyers, obtained with the cooperation of a national department store. The relatively small proportion of low income households in the sample indicated two factors. First, as indicated by Statistics Canada expenditures data, low income households are less likely to be buying major appliances. Second, low income households may be more inclined to buy second-hand or from discount dealers rather than from national department stores. However, despite the limited sample of low income households a clear picture was evident:

- Low income households gave a higher importance to 'initial price'.

- Low income households were less willing to pay more for lower operating cost.

- Low income households were less likely to notice the Energuide label.

- Low income households were more likely than higher income to buy manual defrost refrigerators. Accordingly, their purchases had better energy efficiency.

- The energy efficiency of freezers purchased by low income households was no different from those purchased by households with higher incomes.

The refrigerator versus freezer comparison was important. With refrigerators the more efficient products are also less expensive. However, this is not the case for freezers. Since the findings showed that low income households purchase refrigerators that are more efficient, but freezers that are not, the primary motivation is clearly low price. Money available at the time of purchase obviously dominates the thinking of the low income. Spending extra to save later may not seem possible.

Does the Canadian Oil Substitution Program, COSP, Serve the Needs of Low Income Households?

The data available for analysis was from research which had the purpose of comparing households that used COSP with those that did not. As a result the study data did not directly address the important question raised above. The fundamental analysis needed is to determine whether or not among users of COSP, the proportion of low income is at least as high as the proportion of low income in the national population.

It was evident from the Statistics Canada Expenditures data that usage of oil for heating was uniformly distributed across income groups (approximately 40% of families had fuel oil expenditures). It was also evident from the Expenditures data that families paying for fuel oil were paying approximately 20% more than families paying for natural gas. This indicates that in addition to the national objective of switching from a more limited fuel, COSP can realize a special objective for the low income segment, namely helping to conserve their very limited family incomes.

The comparison of low income households that did versus did not convert from oil heating indicated the following:

- Very little difference in demographics

- Very little difference in house characteristics, although the house age for nonconverters appeared to be older.

- Very little differences in attitudes regarding the importance of energy conservation.

- Nonconverters were much more concerned about the cost of conversion. In particular, although they were almost fully aware of the availability of COSP and of the amount of the COSP grant, nonconverters felt that the level of grants was insufficient to enable their conversion.

Conclusions

The synthesis of this report is presented here in three sections, First, there are two themes that seemed consistently evident during the analysis of the various data sets. These are discussed under the headings, Energy Expense Poverty and Cash Flow Dominance. Second, consideration of the situation facing low income households leads to the recognition of particular energy problem areas, and accordingly, to the identification of energy program priorities aimed at aiding these families. Third, several short term research issues became obvious during the course of this study. These are listed in the final section.

CONSISTENT THEMES

Energy Expense Poverty. Both the Statistics Canada Expenditures data and the Energy Consumption and Conservation Survey indicate the problem low income

households have in reducing their energy spending to match their incomes. From Statistics Canada data, low income families spend 80% of what high income families spend on heat and light. Yet the total budget of the low income is only one third that of the high income. Even worse, low income unattached persons on one quarter the annual budget have heat and light expenses that are equal to their higher income counterparts. Using the ECCP data to segment homeowners showed that, while low income retired families were able to achieve somewhat lower heat and light spending, this expenditure for non-retired families did not decrease as incomes decreased.

In conclusion, all low income families are unable to keep their heat and light expenditures in line with their incomes. The most serious cases appear to be unattached persons and non-retired family homeowners. It seems clear that a careful reader of existing data must conclude that energy expense poverty is a major problem facing low income families in Canada.

Cash Flow Dominance. All three studies that focused on government conservation programs showed that low income households place more emphasis on the present cost than on potential savings in the future. From the Energuide research, low income households purchased energy efficient appliances only when they were also less expensive. From the CHIP research, low income households, while taking as many in home conservation actions, indicated their feeling that adding more insulation or other energy saving devices were not currently affordable. From the COSP research a major reason given by low income housenolds for not applying to COSP was that the grant and potential savings were insufficient to justify their furnace conversion.

The perspective seems very clear and not particularly surprising. When a household has to worry about the adequacy of their money in terms of covering

day to day needs, it is not surprising that future savings may be less important. In other words, current expenses take precedence over longer term considerations and results in cash flow dominance.

Future initiatives to assist low income households with energy expenses must be designed to account for the importance of cash flow dominance in their lifestyles.

ASSISTING THE LOW INCOME: ENERGY PROGRAM PRIORITIES

The priorities for initiatives to assist low income households can be considered from two views, priority energy forms and priority program types. The Statistics Canada data indicated households have much more diffculty matching heat and light expenses to income than they do with gasoline expenses. Thus in terms of energy type, it seems that programs dealing with in-home energy should take priority over programs concerned with automobile gasoline. It was noted in the ECCP data, that non-retired homeowners had as much difficulty with gasoline expenses as they did with heat and light. In other words for this segment of the low income gasoline is equally important. However, in general in-home energy should be the top priority.

Selection of priority conservation initiatives is facilitated by reviewing existing major government policies in light of the analysis presented in this report. The following summarizes four major policy areas -- prices, standards, subsidies, and information.

Conservation via a policy of rising prices. It is clear from the forgoing analysis, that this approach places a major hardship on low income households. From the perspective of the low income this is probably the worst possible conservation approach. The implication is that if rising prices are important

to overall national energy conservation, direct fuel subsidies for low income households should be considered.

Conservation via efficienty standards. It is evident from ownership data that low income households own fewer and older houses, appliances and automobiles. As result product standards, while effective in general, provide less benefit to the low income segment. Further, new product standards may have the short run effect of insuring that the second-hand market has a good supply of inefficient products and accordingly, an undesirable impact on the low income.

Conservation via retrofit subsidies. As was seen in the CHIP and COSP research, retrofit subsides appear to serve the needs of low income households, but may not go far enough. In particular the cash flow difficulties facing the low income appear to be a major deterent to retrofiting, even when a partial subsidy is available. Taking COSP as an example, it is highly desireable to assist low income households to switch from oil to gas. The Statistics Canada data indicated that fuel oil spending was typically 20% higher than natural gas. However, with a COSP grant of $800, the homeowner still has to spend $800 or more. Not surprisingly low income families may find this sum beyond their means. The implication is that retrofit subsidy programs must recognize the cash flow situation facing low income households, and be designed accordingly - for example full subsidies for the low income, or loans repayable from future savings.

Conservation via information programs. It appears from the earlier analysis that low income households are reasonably well informed regarding ways of conserving energy. Apparently conservation information programs have served the low income as well as other income segments. Information regarding appliance

efficiency, Energuide, appears less useful for the low income because of their less frequent purchase frequency and their cash flow constraints. The general implication appears to be that information programs may be useful, but should not be viewed as a primary means of assisting low income households.

In summary the analysis presented in this report indicates that the priority area for assisting low income households must be in-home energy, particularly heating costs. It appears that the conservation options needing priority consideration include energy subsidies and retrofit grants specially designed for low income families.

RESEARCH ISSUES

Three areas emerged as in need further research attention. First, both CHIP and COSP were reviewed without the benefit of complete program data. As a result some of the conclusions reached may be considered contentious by the managers of these programs. To the extent contentions arise, further analysis of program data would serve to amplify or modify the conclusions reached here.

Second, this research has served to point out how important renters are as a segment of the low income, and also how little information is available regarding the situation facing low income renters. This obviously represents a very critical direction for future research attention. An important starting point in this regard would be analysis of conservation actions by landlords of low income dwellings.

Finally, this report concludes that income dependant subsidies and grants appear to offer most promise in terms of helping low income households with their in-home energy expenses. Efforts of this type have been initiated elsewhere, in the U.K. and the U.S. Research into their successes and failures is an important first step in evaluating similar options for Canada.

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FOREWORD

Readers interested in an overview of this report are encouraged to read Chapters 1 and 8.

The authors gratefully acknowledge the helpful assistance of Richard Dee, Scott Fraser, Scott Greenwood, and Nigel Harrison in the preparation of this report. We would also like to thank Dennis Anderson, Gordon McDougall, and Tae Oum for their assistance in the analysis of the data.

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ABSTRACT

This report analyzes a broad range of existing data with the purpose of describing energy related issues and problems that face low income Canadians. The analysis includes data from Statistics Canada, national consumer surveys conducted by Consumer and Corporate Affairs Canada, and research studies focused on three government programs, CHIP, COSP and Energuide. For each of these data sets the analysis compared low versus high income households. Where possible low income was defined using the Statistics Canada low income cut-off (LICO). In addition, the analysis looked for differences between retired and employed low income households.

Comparison of in-home energy expenses with auto gasoline expenses indicates low income Canadians are not able to cut back in-home expenses to match their incomes. On the other hand, auto related expenses are cut drastically, more than commensurate with their income levels. Although all low income households indicate that they are doing a number of conservation activities, the retired appear to be somewhat more successful than the employed in terms of reducing their energy expenses.

The final section discusses the implications of the low income findings for energy prices, efficiency standards, retrofit subsidies and information programs. The conclusion reached is that conservation options needing priority consideration include energy subsidies and retrofit grants specifically designed for low income families. Further, an initial step in this direction would be attention to initiatives of this type that are being introduced in other jurisdictions.

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CHAPTER 1

INTRODUCTION

Low income families in Canada have been recently described as "Canada's Forgotten Poor."[1] Whether or not this description is accurate in general, it does seem to be an accurate description of the lack of concern for low income people in the energy area. While agencies in other countries[2] have developed programs to help low income families with household heating expenses, in Canada major initiatives of this type have not been developed.

Concern regarding this problem led the Canadian Department of Consumer and Corporate Affairs to initiate the research described in this report. The intention was to take a closer look at existing data with the purpose of providing an initial interpretation of the energy expenditures of low income Canadian households and of governmental policies that influence such expenditures.

For example, government energy policy has included deliberate increases in energy prices. Has this created a particular hardship for low income families? What have these families done to adapt to these rising prices? Government conservation programs have attempted to help householders reduce energy expenses through encouraging conservation actions including home insulation, providing information on energy efficient products, and setting automobile gasoline efficiency standards. Have these programs helped those with low incomes compensate for the pressure caused by higher energy prices?

The focus of the present research was on questions of this type. As the study was being formulated it appeared that there were a number of data sets that might be helpful. Accordingly, the decision was that an appropriate beginning would consist of an analysis and interpretation of existing data.

A number of data sets are analyzed in the following report. Following a presentation of the results, the findings are discussed in terms of future energy policy.

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Prior to analyzing the various data sets it is important to consider the term "low income." The rationale for looking at low income families is the

implication that they are facing an unhappy situation as a result of economic hardships. However, the analytical problem is that low income, as indicated by a measure such as "annual family income", is not entirely equivalent to economic hardship. In other words, an income of $10,000 per year for family with three children between 1 and 7 years living in a Montreal apartment, is undoubtably not equivalent to $10,000 per year for a retired couple living in a mortgage-free cottage in the suburbs of Victoria.

The method employed by Statistics Canada to produce more equivalence across households is to identify the point at which individuals and families spend 58.5% of their income in 1982 on food, shelter and clothing. This has been found to depend mostly on family size and city size. For example, a family of four living in a rural area with an income below $14,110 would usually spend more than 58.5% on the three basics. The same size family in a big city would spend more than 58.5% unless its income was at least $19,180. To state this another way, families with higher incomes tend to spend a lower proportion of their income on the three basics. As incomes drop below a certain point, referred to as the "low income cutoff" (LICO), more than 58.5% is likely to be spent on food, shelter and clothing.

For the research reported here, "low income" was analysed in two ways. Wherever the data allowed, households were segmented into those below and those above the LICO. Secondly, where possible, households were also segmented into employed-retired to account for possible differences in spending patterns (e.g., living in mortgage-free homes) and needs.

Footnotes (Chapter 1)

1. Maclean's; cover story, "Canada's Forgotten Poor," January 30, 1984, pp. 14-23.

2. For example, The Citizens Energy Corp., Boston, U.S.A., has been established to help low-income consumers save on their heating bills. The National Right to Fuel Campaign, Bradford, U.K., is promoting the "Cost of Warmth Index" to measure levels of fuel poverty experienced by low income families.

CHAPTER 2

STATISTICS CANADA DATA

Nineteen seventy-eight was the last year in which a complete set of energy related expenditure data were available. Furthermore that was the same year in which the ECCP data was collected. Thus, the following discussion will focus on the 1978 Statistics Canada survey data. For comparative purposes, the 1982 Statistics Canada survey data are also presented and are the focus of discussion when the 1982 but not the 1978 data addressed a particular issue studied in this project. First, the demographics (i.e., the size and nature) of the low income segment will be determined. The houses, appliances, and automobiles owned by the lower (and higher) income groups will then be examined. Actual expenditures in these energy-related categories will follow. Finally utility expenditures (i.e., heating bills) will be discussed. While people in the unattached low income category will be examined, the focus of the discussion will be on low income families, since the other samples examined in this report (e.g., the ECCP data) consisted of families. Some particular characteristics of unattached individuals will also be mentioned.

Demographic and Socioeconomic Characteristics

Regarding the size of the low income segment, (Category 1, Table 2-1), in 1978 approximately 11% of Canadian families were classified as being below LICO (i.e., in the low income segment), while 36% of those living alone (unattached) had low income. By 1982 more than 3 million Canadians had incomes below the Statistic Canada poverty line.

Compared to those above LICO, the people below LICO are older and less educated (Category 2, Table 2-1). They are also more likely to live in the

Atlantic provinces and Quebec (for families, but not for unattached, see Table 2-2). However they live in town/cities that are approximately the same size.

While in general, families tend to be headed by males, a larger percentage of families below LICO (33%) versus above LICO (7%) have a female as head of the household (Table 2-1). This includes the large number of single parent families below LICO that have females as head of the household (30% vs. 6% with female heads above LICO; Table 2-1). For unattached individuals, 65% of those below LICO are female and 51% of those above LICO are female.

As would be expected, households below LICO are less likely to be in the labor force and more likely to receive their income from transfer payments (Table 2-1). The unattached, below LICO, containing many elderly people, are also relatively more likely to receive their income from transfer payments.

In summary, the number of Canadians with incomes below LICO is large. Their demographic profile suggests a group of people who are older, less educated and more likely to live in the eastern part of Canada. There are more females as heads of households and as would be expected the below LICO include a large number of people not in the labor force and dependent on transfer payments for their income.

Housing

Regarding the housing of families below LICO, they are much less likely to own their own home (Category 1, Table 2-3). Among low income families 49% own their dwelling vs. 76% ownership by those with higher incomes. People below LICO are also more likely to own older homes (32% vs. 22% pre-1940 homes), which may to some extent reflect of the large elderly component of the below LICO group. Further, there are somewhat fewer rooms in below LICO houses (5.3 vs. 5.9 rooms). Smaller house size is consistent with the result reported earlier

that a greater percentage of those below LICO were over 65 and therefore less likely to have children living with them.

The differences in housing characteristics between families below and above LICO are greater than the differences for unattached individuals in the below and above LICO categories. It is not surprising to find that unattached individuals had fewer rooms (Table 2-3). Further, it is important to note that as of 1982 78% of the unattached low income were renters.

The high proportion of renters in the below LICO category is particularly noteworthy. Their presence raises a number of issues. First, since renters often do not pay for energy directly, they are unlikely to be affected by or pay attention to government energy conservation programmes. Second, even if renters do pay for energy directly, they are probably unwilling to make capital expenditures for conservation purposes in a building they do not own. Third, it should be noted that most of the available research data concerns households that own their own living premises. In other words, less is known about most low income households because they are renters, plus government conservation programs are likely to miss these people.

Appliances

Families below LICO are less likely to own automatic washers, dryers, freezers and dishwashers (Category 2, Table 2-3). Between 15 to 20% more of those above LICO owned these major appliances. However, it should be noted that 21% more of those above LICO were homeowners (Category 1, Table 2-3). In other words, the level of appliance ownership per homeowner may be similar to both income groups.

There is less difference in appliance ownership between those above and below LICO for unattached individuals. This corresponds to the similarity in home ownership across this segment.

Automobiles

Both families and unattached individuals below LICO are less likely to own automobiles (Table 2-3). For families below LICO 41% own no car versus 11% for families above LICO. Among unattached below LICO 73% own no car versus 42% for those above LICO. Car ownership appears to be a major way in which low income households economize.

Expenditures

With regard to expenditures, the Statistics Canada data available for analysis were from 1978. These data were broken down by income levels, not LICO categories. In addition, it should be noted that the expenditure data are based on a respondent's estimate of how much was spent over the past year in various expenditure categories. Such data, based on recall, may not be as reliable as the demographic and other data reported in Tables 2-1 and 2-3. The expenditure data are presented in Table 2-4.

Overall, as would be expected, people with lower incomes spend less, and unattached people spend less than families. This general pattern is indicated when shelter expenditure is examined. Low income people spend less on shelter, particularly unattached low income people (Category 1, Table 2-4). As the earlier data showed, low income people are more likely to rent. Furthermore, their dwellings are likely to be somewhat smaller. Both factors would be associated with a lower expenditure on shelter.

While mean expenditures are lower, it is important to note that low income people spend a larger percentage of their total expenditures on shelter. This suggests that people find it difficult to economize on shelter expenses.

In many spending categories, people can cut costs by not buying a product at all or, among purchasers, by spending less. As shown in Table 2-4, for both small and large appliances both effects are seen. The strongest effect is seen in the percentage buying on small or large appliances, where the proportion increases directly with income. In addition, lower income families who are major appliance buyers spend less per spender, reflecting their limited incomes. In contrast appliance spending patterns among unattached individuals show little linkage with income.

With regard to transportation expenses, there is a strong direct relationship between income and spending on car and truck purchases and operating expenses (Table 2-4). In lower income groups, fewer people purchase cars and trucks. Low income people who do make such purchases spend less on the vehicle purchased. Further, lower income groups are less likely to own automobiles and spend less on operating expenses. It appears that car and truck expenditures are an area in which lower income people have been able to economize. A similar pattern holds for "other" transportation expenditures, a broad category which includes both within city (e.g., mass transit) and intercity expenditures.

Energy Expenditures

Turning now to energy expenditures, consider families first and then unattached individuals, as the two data sets are somewhat different. As can be seen in Table 2-4, virtually all families pay for electricity, varying from 86% for families in the below $4,000 category to 94% in the above $16,000 category.

Approximately the same percentage of all income categories (41%) pay for natural gas; with fuel oil, there is an increase in percent paying in the above $16,000 category. In terms of energy expenditures per se, there is a direct relationship between amount spent and income, but the ratio of spending in the highest to lowest income category for electricity was slightly less than 1.5 to 1; for car/truck operating expenses, the ratio was more than 2 to 1. For natural gas and oil the results are even more striking. For families in all but the highest category, expenditures among spenders are virtually constant in all three income categories. Moreover, the ratio of expenditures of high income to low income groups is less than 1.2 to 1. These data suggest that lower income families have difficulty in reducing their household energy expenditures and that such expenditures make up a larger proportion of their total expenditures than for higher income groups.

For unattached individuals, the data also show the inability of lower income people to reduce their expenditures. In a number of instances, lower income groups are both more likely to be spending on a given energy source and to spend more per spender. Overall, unattached individuals are less likely than families to pay for each source of energy, reflecting the greater incidence of renters in the unattached category. Similarly, their smaller living quarters leads to lower expenditures per spender.

Spending on gasoline, in contrast, suggests (Table 2-4) substantial differences across income groups. For example, almost all families with incomes above $16,000 spend money on gasoline, while only about three-quarters or less of low income families spend any money on gasoline. Perhaps even more significant, the amount spent per spender on gasoline is twice as high for the highest income group as for the lowest income group. These data confirm the earlier data which suggest that automobile expenses are an area where lower

income people can and do cut back on their expenditures. Unattached individuals, as compared to families, spend less in each income group. As mentioned earlier, a larger percentage in the unattached category are over 65, where there is less likelihood of owning and of using a car to commute to work since most people over 65 are presumably retired.

The 1982 Statistics Canada data enabled us to look directly at households making energy improvements (Table 2-5). About 70% of the population claims to have added insulation, with smaller but still substantial, percentages reporting expenditures on both improving their heating equipment and on means to reduce drafts. Most significantly, for the current study, the percentages for each category did not vary by income. In other words, according to these data, members of all income groups are equally likely to have made improvements to reduce household energy consumption.

Conclusions from Statistics Canada Data

1. As of 1982 there were more than three million Canadians with incomes below the Low Income Cut-off. In particular there were 768,000 families each with an average of 3.3 people, and 962,000 unattached individuals.
2. Low income families (compared with those with higher incomes)
   - 25% over 65 years of age (vs. 12%)
   - 40% less than 8 years education (vs. 24%)
   - 34% female household head (vs. 8%)
   - 51% rent their dwelling (vs. 24%)
   - 37% own NO car (vs. 9%)
   - Have total spending equal to 33% of higher income families
   - Have home energy spending equal to 70 to 85% of higher income families
   - Have car gasoline spending equal to 28% of those with higher incomes.

3. Low income unattached individuals (compared with those with higher incomes)
   - 44% over 65 years of age (vs. 19%)
   - 43% less than 8 years education (vs. 15%)
   - 67% female household head (vs. 50%)
   - 78% rent their dwelling (vs. 72%)
   - 70% own NO car (vs. 36%)
   - Have total spending equal to 25% of higher income families
   - Have home energy spending equal to 95 to 130% of higher income families
   - Have car gasoline spending equal to 15% of those with higher incomes.
4. Low income households report doing as many conservation actions as those with higher incomes.

Implications

The high proportions of elderly and single women among low income households indicates the need for special attention to these two groups.

As mentioned earlier the high proportion of renters among low income households is worrisome in that government conservation programs are typically aimed at home owners.

Comparisons of in-home vs. automobile energy expenditures indicate that low income households appear much more able to economize on their auto expenses. In other words, low income households do not appear to be able to make discretionary reductions in their in-home energy spending. As a result, rising in-home energy costs seem particularly problematic.

TABLE 2-1: STATISTICS CANADA: DEMOGRAPHIC CHARACTERISTICS

	FAMILIES				UNATTACHED			
	1978[1]		1982[2]		1978		1982[2]	
	-LICO	+LICO	-LICO	+LICO	+LICO	-LICO	LICO	+LICO
1. Size of Low Income Segment								
% of households	11	89	12(9)	88(91)	36	64	38(27)	62(73)
# of Canadian Households (000's)	637	5170	768(596)	5650(5822)	470	829	962(682)	1582(1862)
% 65+ (Age of Head)	26	12	15(13)[3]	12(13)	46	23	44(38)	19(25)
% < 8 yrs. Education	47	28	40(40)	24(24)	42	18	43(42)	15(20)
% Female Heads	33	7	34(38)	8(8)	65	51	67(67)	50(52)
Single Parent Families								
With Male Head	NA	NA	2(2)	1(1)	--	--	--	--
With Female Head	NA	NA	30(34)	6(5)	--	--	--	--
% NOT in Labour force	56	16	48(51)	17(18)	70	26	68(68)	23(30)
% Inc. from Trans. Pmts	61	7	49(53)	7(8)	61	11	60(60)	8(16)
City size diff. % Living in urban areas 100,000+)	53	56	54(54)	57(57)	64	67	69(75)	68(66)

[1]The LICO cut-off point Statistics Canada used for the 1978 data was 62% of income (arrived at through analyzing a 1969 data base). That is, a household was defined as below LICO if they spent more than 62% on food, shelter and clothing.

[2]The LICO cut-off point for 1982 was 58.5% (a 1978 data base was used by Statistics Canada to arrive at that figure). The values in parenthesis were determined using the same 62% cut-off point developed from the 1969 data and used for the breakdown of the 1978 Stats Canada data. In our discussion of the table we focus on the 58.5% figure since it is the one most recently developed. Nevertheless, we report LICO breakdowns with the 62% cut-off point since Stats Canada presented the LICO breakdowns for 1982 data using both cut-off points.

[3]While the percentage of elderly in the population is generally increasing, Stats Canada Survey data indicated some decline in this percentage between 1978 and 1982.

TABLE 2-2: STATISTICS CANADA: REGIONAL DIFFERENCES

	FAMILIES				UNATTACHED			
	1978[1]		1982[2]		1978[1]		1982[2]	
	-LICO	+LICO	-LICO	+LICO	-LICO	+LICO	-LICO	+LICO
Atlantic Provinces	12.5	8.4	12.0(11.9)	8.2 (8.3)	8.4	6.4	7.2 (6.8)	5.7 (6.1)
Quebec	31.1	26.4	33.0(32.5)	25.9(26.1)	24.4	22.9	32.7(35.7)	21.2(21.7)
Ontario	31.4	37.5	29.9(29.8)	36.8(36.6)	36.1	36.1	31.3(28.9)	36.5(36.6)
Prairie Province	16.4	16.1	16.2(16.3)	17.3(17.3)	18.0	9.5	16.1(15.4)	21.8(21.2)
B.C.	8.8	11.2	9.0(9.4)	11.8(11.7)	13.0	15.1	12.7(13.2)	14.9(14.4)

[1]The LICO cut-off point Statistics Canada used for the 1978 data was 62% of income (arrived at through analyzing a 1969 data base). That is, a household was defined as below LICO if they spent more than 62% on food, shelter and clothing.

[2]The LICO cut-off point for 1982 was 58.5% (a 1978 data base was used by Statistics Canada to arrive at that figure). The values in parenthesis were determined using the same 62% cut-off point developed from the 1969 data and used for the breakdown of the 1978 Stats Canada data. In our discussion of the table we focus on the 58.5% figure since it is the one most recently developed. Nevertheless, we report LICO breakdowns with the 62% cut-off point since Stats Canada presented the LICO breakdowns for 1982 data using both cut-off points.

TABLE 2-3: STATISTICS CANADA: HOUSING, APPLIANCES AND AUTOMOBILES

	FAMILIES				UNATTACHED			
	1978		1982[1]		1978		1982	
	-LICO	+LICO	-LICO	+LICO	-LICO	+LICO	-LICO	+LICO
1. Housing								
% Owning	54	75	49(46)	76(75)	35	31	22(28)	28(36)
% Single Detached	51	66	48(46)	67(67)	32	26	29(25)	29(30)
% Pre-1940	32	22	28(29)	19(19)	37	28	29(27)	23(25)
# of Rooms	5.3	5.9	5.0(5.3)	6.1(6.1)	3.7	3.9	3.7(3.6)	4.2(4.1)
2. Appliances								
% Homeowners Owning Automatic Washers	50	71	58(58)	80(79)	19	23	27(26)	33(32)
% Owning Auto Dryers	53	72	59(57)	79(79)	18	22	27(26)	34(33)
% Owning Freezers	42	57	28(45)	66(66)	16	16	23(20)	23(24)
% Owning Dishwashers	14	30	19(18)	42(42)	4	7	6(6)	14(13)
3. Automobiles								
% Owning NO cars	41	11	37(41)	9(9)	73	42	70(72)	36(41)

[1]The LICO cut-off point Statistics Canada used for the 1978 data was 62% of income (arrived at through analyzing a 1969 data base). That is, a household was defined as below LICO if they spent more than 62% on food, shelter and clothing.

[2]The LICO cut-off point for 1982 was 58.5% (a 1978 data base was used by Statistics Canada to arrive at that figure). The values in parenthesis were determined using the same 62% cut-off point developed from the 1969 data and used for the breakdown of the 1978 Stats Canada data. In our discussion of the table we focus on the 58.5% figure since it is the one most recently developed. Nevertheless, we report LICO breakdowns with the 62% cut-off point since Stats Canada presented the LICO breakdowns for 1982 data using both cut-off points.

TABLE 2-4: STATS CANADA EXPENDITURE DATA

EXPENDITURES 1978 INCOME CATEGORIES	FAMILIES 0-8	FAMILIES 8-12	FAMILIES 12-16	FAMILIES 16+	UNATTACHED 0-8	UNATTACHED 8-12	UNATTACHED 12-16	UNATTACHED 16+
Mean Expend/Group ($000)	7.5	11.0	15.1	22.5	5.0	10.4	13.7	20.2
# of Households in each group (000)	590	679	877	4,055	734	216	178	240
1. Shelter								
Mean Exp'd per household ($000)	1.8	2.2	2.6	3.8	1.5	2.3	2.4	3.3
% of Exp'ds on Shelter	23	20	17	17	30	22	18	16
2. Appliances								
% spending on major appliances	26	31	34	41	12	19	20	27
$/spending household	325.	377.	449.	533.	243.	309.	239.	307.
% spending on small appliances	32	38	39	51	18	32	34	39
$/spending household	48.	43.	48.	60.	40.	40.	55.	44.
3. Transportation								
% buying cars/trucks	13	23	29	36	5	14	20	18
$/spending household	2600.	2400	3300.	4100.	2200.	3000.	3800.	3800.
% spending on car/truck operating	61	80	89	95	26	52	60	86
$ spending household	780.	990.	1200.	1670.	590.	1170.	1130.	1660.
% spending on "other" transportation	62	62	64	73	69	83	85	83
$/spending household	180.	260.	270.	390.	160.	270.	370.	580.
4. Energy Expenditures								
% paying for Elec. & $/payer	86/261.	90/294.	90/314.	94/377.	70/196.	67/175.	64/144.	73/206.
% paying for Natural Gas & $/payer	23/334.	24/332.	24/328.	35/386.	22/278.	13/265.	12/158.	17/248.
% paying for Fuel Oil & $/payer	41/404.	43/413.	41/404.	41/469.	27/396.	19/404.	17/365.	19/305.
% spending on Gasoline & $/spender	58/343.	77/470.	86/579.	94/751.	24/254.	48/445.	58/463.	68/607.

TABLE 2-5: STATISTICS CANADA 1982 DATA ON PERCENTAGE OF HOUSEHOLDS MAKING ENERGY IMPROVEMENTS

	0 - 8	8 - 16	16+
Insulation	69%	71%	72%
Heating Equipment	31%	31%	32%
Reduced Drafts	39%	42%	43%

CHAPTER 3

OVERVIEW OF ECCP DATA

The survey of Energy Consumption and Conservation Patterns conducted by Consumer and Corporate Affairs Canada focused on family homeowners. The analysis segmented this group into those that were retired and others. This segmentation was done on the assumption that retired households may be a special case of low income deserving special attention.

The analysis of the ECCP data indicates that the demographics of the survey households are similar to the Statistics Canada data analyzed earlier. Particular attention to the "employed" segment indicates that low income households have somewhat larger families, low levels of education, and lower levels of full-time employment. Further, the lower income "employed" tend to live in older homes. They own approximately the same number of autos, but these cars tend to be larger, as indicated by the number of cylinders.

Analysis of conservation attitudes and actions indicates both "low income effects" and "retirement affects" as follows:

- low income homeowners are more skeptical about the importance of energy conservation, blaming business for the problem.
- retired homeowners are more positive toward conservation.
- low income homeowners are making many attempts to reduce their energy consumption, these efforts being amplified when the family is retired.

- Retired homeowners with low income spend less on electricity, heating, fuel, and gasoline than their higher income counterparts.
- Among employed homeowners spending on electricity, heating fuel, and gasoline does not change with income. That is, lower income families are not able to adjust energy spending to match their incomes.

Methods

The ECCP data is a selection of specific items of interest from a larger survey of Energy Consumption and Conservation Patterns among Canadian homeowners. The survey has five components:

(1) Annual household energy consumption including home heating, electricity, and automobile gasoline. (Gasoline consumption data is obtained from self-reporting, but other consumption information from was obtained directly from utilities, after respondent authorization had been obtained.)

(2) Description of dwelling, appliances, automobiles and recreational vehicles.

(3) Description of behavioural patterns regarding home heating and auto usage.

(4) Family demographic characteristics.

(5) View of male and female household heads on general and energy-specific conservation attitudes, and activities.

The sample was a random sample of a national panel of Canadian households, with a total sample size of n = 1979.

Analysis

The data was broken down according to employment status (employed versus retired) and income category.

The income categories were designed to correspond as closely as possible to the low income cutoff (LICO) criteria used by Statistics Canada in their published census data. The LICO criterion is based on family size and household location in addition to income, so that an urban family of four, for instance, would have a lower income cutoff than a rural family of two. To obtain a more accurate picture of those above and below the LICO line, each category was further subdivided into two to generate a total of four categories:

- Very low income, more than $5000 below LICO
- Low income, within $5000 below LICO
- Moderate income, within $5000 above LICO
- High income, more than $5000 above LICO.

The data set also contained a small number of single-family dwellings which were rented rather than owned. It was believed that these renters would not be representative necessarily of the views of either homeowners or apartment renters. They were therefore omitted from the sample. This focus on homeowners, who are the target of a number of government energy conseration programs, leads to some differences in the profile of these respondents as compared to the Statistics Canada data.

The lifestyles of retired elderly people differ substantially from those who are younger, whether employed or employment seeking. In order to better understand the dynamics of attitudes in the various income

groups, each income group was hence subdivided into employed and retired categories.

Introduction to Results

This report looks individually at each of the major data subsections. First, a demographic profile is obtained. Then, respondents are compared on their housing characteristics and then on their automobile ownership and usage. Next, respondent attitudes are investigated in a number of areas--general energy attitudes, and attitudes toward government, business, and commuting. Finally, actual energy saving behaviours and energy consumption and expenditure levels are investigated.

In each case the thrust of the analysis is on how those homeowners in the low income groups differ from the others. The results for the low income group are emphasized in interpreting the data since the sample size for the low income group is much larger than the sample size for the very low income group. Although the study is largely descriptive in nature, a variety of interesting results and possible hypothesis for future studies are suggested.

A brief comparison of our major results with those obtained from the WAVE data concludes the ECCP section of the report.

PROFILE

This section breaks down the demographic characteristics of the survey respondents, looking descriptively at their families, employment status, education, and geographic location. The ECCP data reported here

differ somewhat from the Statistics Canada data reported in the previous chapter because of the focus here on homeowners.

The overall sample size was 1979 people, distributed across income and employment status categories as shown in Table ECCP.1. It should be noted at the very low income end of the scale sample sizes are relatively small (n = 22 for very low income-retired).

Family

Table ECCP.2 shows the average age of household heads for respondent families. There is, naturally, a large age difference between retired and employed people (45 versus 70 years of age).

Family size, in Table ECCP.3, shows differences not only between the employed and retired, but also along income lines. Retired homeowners, of course, have fewer members in their families. Further, as income level decreases, family size tends to grow, with families in the very low income bracket having, on average, one more person than those in the high income group.

Employment Status

Not surprisingly, employment status, more than any other demographic variable, varies across income levels. In the case of men (Table ECCP.4), nearly twice as many in the high income (92.9%) versus the low income (53.3%) bracket have a full time job. For women the discrepancy is even greater, 27.1% for high income versus 6.7% for low income families (Table ECCP.5). Thus, high income families are more likely to have the two incomes coming into the household.

Education

Table ECCP.6 shows the distribution of homeowners with males having education greater than high school. More than half those in the high income bracket have post-secondary education of some form. In the lowest income group, this falls to 22.7% for employed and 10.0% for retired respondents. This latter result suggests that, while education levels are rising, a large gap does still exist.

City Size

Looking at the city size (Table ECCP.7), in the ECCP sample there is a high incidence for those in the very low income group, whether employed or retired, to live in smaller communities.

Geographic Location

On a regional level, the heaviest concentration of low income homeowners in this sample data is in Quebec, although this is more true of the employed than of the retired respondents (Table ECCP.8). This contrasts with the high concentration of high income people in Ontario.

HOUSING

Of great importance in distinguishing home owning income groups is Mean House Age (Table ECCP.9). There is a strong trend for lower income and retired people to live in older houses. The greatest differential is within the employed group where high income families live in homes that average 21.7 years old and low income families live in houses that average 39.6 years.

There is somewhat less of a difference in the Mean Number of Rooms in House (Table ECCP.10). Within the employed segment there is no difference. Among retired people, the low income segment can be said to have slightly smaller houses.

AUTOMOBILES

As would be expected, the Mean Number of Autos per Household (Table ECCP.11) is significantly higher in employed homeowners than in retired homeowners. Among the employed there is little difference in car ownership across income levels. However, among the retired, low income households own fewer cars.

The Mean Number of Cylinders per Car is greater in the lower income groups (for employed households: 6.8 versus 7.3 in the high versus very low groups, Table ECCP.12). Consistent with the earlier interpretation of Statistics Canada data, the low income groups seem to have less opportunity to purchase new, more fuel-efficient cars.

In Table ECCP.13, Mean Weekly Miles Commuting per Household, are presented. (The figures for retired homeowners represent the small proportion who do various forms of part-time work). The high income employed homeowners commute, on average, almost twice as far per week as those at the very low income level. It was pointed out previously that more high income homeowning families have two employed members (Table ECCP.5).

High income families also drive more Total Miles per Week (Table ECCP.14). This effect is the case among both employed and retired households. The financial burden of owning and operating a car probably

accounts for the difference in total amount driven between the low and high income groups.

Total Gallons of Gas Consumed per Year (Table ECCP.15) is almost constant across income levels for employed homeowners. Low income retired homeowners use less gasoline than higher income retired homeowners. However, the biggest difference is between employed and retired homeowners, which reflects the amount each group drives. It is interesting that while the higher income employed groups drive more than the lower income employed groups, gasoline consumption of the two groups is similar. As pointed out earlier, the lower income groups have larger and presumably older and less energy-efficient cars.

ATTITUDES

In the attitudes section of the questionnaire, respondents were faced with fifteen statements and were asked to rate each on a six-point agree-disagree scale ranging from definitely agree (6) to definitely disagree (1). Attitudinal responses were classified into four categories: (1) General Attitudes (6 questions), (2) Attitudes toward Government (4 questions), (3) Attitudes toward Business (3 questions), (4) Attitudes toward Commuting (2 questions).

General Attitudes

Regarding general attitudes, the data in Table ECCP.16, Energy Conservation is the Most Important Problem Today, reveals that the responses of both high and low income people were slightly above the midpoint of the scale. There are differences occurring between employed

and retired people. For the most part, employed respondents were neutral to the statement, implying that energy conservation has no special importance to them. Retired respondents, on the other hand, perceived the problem as slightly more important.

A wider income variation across income is seen when we look at The Whole "Energy Issue" is a Fad (ECCP Table 17). Overall, all groups disagreed with the statement, but higher income people tended to disagree more than those with lower income. Further, retired people more than employeds felt it was not a fad, possibly suggesting their concern with the high cost of energy.

The lower income are equally as likely as high income respondents to agree that they Read a Lot About Energy Conservation (Table ECCP.18). However, retired households indicate more activity of this type than employed.

A similar consensus can be seen in Table ECCP.19--Consumers Alone Can't Do Much About the Energy Situation. Here, for all income groups, responses suggested that people believe they can have an effect. Further, all income groups agreed that energy use can be reduced ("Energy Use Can Be Reduced"--ECCP Table 20).

Finally, respondents all agree that Soon Everyone Will Have to Use Less Energy (Table ECCP.21). However, a clear split occurs between the employed and retired. The retired, especially those with very low income, more strongly agree that everyone will have to use less.

In summary, the differences in general attitudes between high and low income homeowners are relatively slight, with greater differences between employed and retired people. In general, the low income see

energy as slighlty more of a fad, possibly suggesting skepticism toward government's and business' concern with the energy issue.

Attitudes Toward Government

A consistent trend can be seen when we look at attitudes toward the role of government in energy conservation. The lower income people have a more negative attitude about government's role in promoting conservation. For certain questions, the responses of the lower income retired group are most negative of all.

When asked whether People Would Consume Less Energy if the Government Passed Laws (Table ECCP.22), the retired were more positive to the statement. Of note is that all employed groups were virtually neutral on whether passing laws would help, while the retired groups ranged from slight disagreement at the very low income end (3.17) to agreement with the statement at the high income level (4.24). Retired respondents believe more than employed respondents that legislation would be effective.

Responses to The Government Spends Too Much Money on Energy Conservation (Table ECCP.23) suggest that all groups disagree with the statement; that is, they believe that the government is not spending too much. This conviction is stronger in high income groups.

Regarding the responses in Table ECCP.24, I Resent the Government and Utilities Asking Me to Conserve Energy, high income people disagree mildly with the statement, while very low income retired homeowners were more resentful than other groups. They probably feel they are already doing the best they can in reducing their energy consumption.

A similar pattern of responses was obtained with I'm Not Willing to Go Out of my Way to Conserve Because Conservation is the Government's Job (Table ECCP.25). Although all income levels disagreed with the statement, it was the very lower income retired who were more inclined to feel it was the government's job.

Attitudes Toward Business

While attitudes toward government were somewhat negative, attitudes toward business were even more negative. When asked whether Most Businesses Make Little Effort to Conserve (Table ECCP.26), the trend was from mild agreement (3.8) for high income respondents, to strong agreement for the lowest income group (4.1-4.8). Within the lowest income group it was retireds who most strongly felt that businesses made little effort to conserve.

An even stronger response is seen in Table ECCP.27 regarding whether Businesses Waste More Energy. Even at the high income level there is agreement, but this is magnified at the low and very lower income levels. Further, there is general agreement that Companies Take Advantage of the Energy Crisis to Increase Profits (Table ECCP.28). The low income group (but not the very low income group, which has a small sample size) shows the strongest (4.90) agreement with this statement This seems to point to a clear lack of trust in business by low income respondents. In fact, the high income group has the most favorable attitudes overall to both business and government.

Commuting

More than any of the previous categories, "Commuting" shows how, when the issue is specific enough, very clear differences emerge. If You Live Near a Bus and it Goes Near Your Destination, You Should Use the Bus (ECCP Table 2a), drew mild agreement from high income respondents, but very strong agreement from those in the low income group (3.9 versus 5.1). In addition, retired homeowners consistently indicate a stronger belief that people should use the bus. These responses may be related to the reality that low income (particularly the retired low income) are probably forced to use the bus more than higher income groups.

Responses also show a clear pattern in Table ECCP.30, Cars Should Have at Least One Passenger When Going to Work. Across income levels there is little difference in the degree of agreement. The split is between employed, who are against such a rule, and retired, who are neutral or mildly agree that cars should have at least one passenger.

BEHAVIOURS

In the "Behaviours" section of the questionnaire, respondents were given eight behaviours which, in some way, could affect energy consumption. They were asked to place themselves into "Already Doing," "Willing to Do," or "Not Willing to Do" categories.

It seems that a wide variety of factors, ranging from economic constraints and physical ability, to long built-up beliefs, affect how different income groups respond to conservation behaviours. A general

trend emerges with lower income people tending to participate more in activities which may result in energy conservation.

Examples of Appliance Using Behaviours

As a broad overview, the Mean Appliance Energy Index[1] (a higher score indicates ownership of more energy using appliance) shows a much greater ownership of energy consuming appliances by high income people (Table ECCP.31). Within the low income segment retired people are least likely to own energy consuming appliances, probably reflecting both appliance costs and time availability.

Two specific appliances were investigated. First, Table ECCP.32 contains responses to a question on "Willingness to Own a Manual Defrost Refrigerator". There is very little difference between employed and retireds at a given income level. Instead, the trend is income driven, with only 20% of high income respondents already owning a manual defrost refrigerator, versus nearly 50% for low income people. It may be that the higher purchase price of a self-defrosting refrigerator simply makes them too costly. The energy savings which accrue may be merely a coincidental outcome.

A clear difference is seen when respondents are asked whether they are Willing to Cut Lawn with a Manual Lawn Mower (Table ECCP.33). Here again there is a trend toward the lower income "already doing it." Employed homeowners, particularly in the very low income group, tend to

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[1] The mean appliance index is the sum of average energy usage of the homeowner's appliances. This index thus weights heavily appliances which consume high amounts of energy.

some extent to use manual mowers more than retired homeowners, suggesting that physical ability is also a prime factor.

Washing Clothes

When asked whether they were Willing to Hang Clothes to Dry (Table ECCP.34), there was a quite strong "Yes" response from retireds (around 55%) saying they already do it, while the employeds ranged from 34% in the high income to 58% in the low income groups. Hence, whereas in the high income group there was a wide difference between the number of employed and retired respondents hanging their clothes to dry, in the very low income group slightly more than half of both segments already did it.

This pattern did not carry over to Table ECCP.35, Willing to Wash Clothes in Cold Water. In the pattern of responses within higher income levels, it is employeds who are more likely to use cold water. It is only at the lowest income level that retireds use cold water more than employeds.

Finally, it should be noted that across all income levels the percentage of respondents who are unwilling to use cold water is about 25 to 35%, whle the percentage actually using it ranges from 12 to 50%. This shows that although the percentage "Willing" is about the same at all income levels, the percentage who actually do it varies widely. If we compare the high and very low income segments, this shows that once low income people are "Willing," they will use cold water. Higher income people are much more likely to be "Willing" without actually doing it.

Water Temperature

There is a tendency for lower income people to be more likely to Reduce the Temperature on Water Heater (Table ECCP.36). The action is simple, has obvious benefits, and would seem to lack any major inconvenience. Further, it doesn't have a "physical" component as some of the previous behaviours did. Yet, overall the number of people doing it is quite low, ranging from 18 to 30%, with low income households more likely to have already taken this action.

In response to Willing to Add Insulation to Water Heater (Table ECCP.37) all groups were quite willing. The differences lie between those who said "I'm willing," and those who actually did it. Most surprising is that at the lower income levels as many as 45% of those surveyed had already added insulation, versus 18 to 27% for high income respondents. This is surprising since adding insulation requires a capital outlay that, presumably, the higher income people are better equipped to absorb.

Space Heating

In Table ECCP.38, Closed Off Rooms in the Winter, employeds are, across income levels, fairly constant (20 to 25%) in their responses. But in the retired group the clear tendency is for higher income people to be more likely to close rooms (35 versus 28%). One explanation for this, within the retired segment, might be that higher income respondents have more rooms and fewer people, (see Table below).

	Mean # Rooms	Mean # People	
High	7.4	2.3	[Retireds]
Very low	6.8	3.0	

For Mean Thermostat Setting (Table ECCP.39) there are only small differences across income and employment. Among both the employed and retired, higher income families report setting their thermostats approximately 1/2 degree lower than families with lower incomes.

CONSUMPTION

This final section, which looks at the energy consumption patterns of respondents, links the previous demographic, behavioural, and attitudinal sections with actual energy consumption. First, overall Btu usage and dollar expenditures per household are investigated, then the component energy types--oil, natural gas and electricity--are investigated.

Overall Energy Use

Total Btu Consumption per Year (Table ECCP.40) in the low income bracket exceeds that of the middle bracket by 5.2%, and is only 2.6% lower than consumption in the highest bracket. We can identify, of course, several factors contributing to this relationship. On the one hand, the lower income have fewer energy consuming devices. On the other hand, they maintain a somewhat higher house temperature. The employed lower income also live in older homes, and larger families. Within the low income group, Table ECCP.40 further points out only a small (2%) difference in consumption between retireds and employeds.

Total Dollar Expenditure per Household (Table ECCP.41) mirrors the results of Btu consumption for the employed segment, showing the lower income group to be in the middle income level. However, for retired

families there is a trend toward significantly decreased expenditure in the lower income group, despite their use of more Btus than the middle income group. This disparity is difficult to interpret, however, is presumably related to variations in energy costs in various regions of the country.

Expenditures on Major Sources of Energy

Turning now to specific sources of energy, Table ECCP.42 presents data for Total Expenditure on Fuel Oil for Fuel Oil Users. Not surprisingly, the pattern is a repeat of overall expenditure trends, except that the lower income employed are seen to spend somewhat more overall on fuel oil than the higher income groups. This, of course, may be attributed to their higher house temperatures and perhaps older less energy-efficient homes or furnaces. The lower expenditure by retired may related directly or indirectly to their smaller household size.

Table ECCP.43, for Natural Gas Expenditures, reveals a similar pattern. Although the final table (ECCP.44, Electricity Expenditures) also reveals the same basic patterns, it should be kept in mind that the effects are not as easy to isolate in this case. Whereas the respondent groups in the previous tables were largely mutually exclusive--people either heat with gas or oil, but generally not both--the electricity group includes those who use electricity for space heating, but also those who use gas or oil for heating but electricity for appliances and lights and so on. Hence, a slight skewing of the results is possible, since the energy mix varies with income group and employment status. Nonetheless, the table still reinforces earlier assertions on expenditure and usage.

THE WAVE DATA ANALYSIS

In a sampling procedure and questionnaire format very similar to that used in the ECCP data, the annual WAVE studies have since 1975 measured the Canadian public's attitudes toward the energy situation. Approximately 1900 male and female heads-of-households in nine cities were contacted by a marketing research firm on an annual basis. This section compares the conclusions drawn in an extended analysis of the WAVE data set over nine years to those drawn from the ECCP data.[1] Although the analysis of the WAVE data was only occasionally subdivided on the basis of income or employment status, the WAVE data are useful both for noting any trends or shifts which may have occurred since the 1978 ECCP study, and for corroborating some of the more general conclusions drawn from the ECCP data.[2]

Overall Sample Observations

Two critical general trends observed in the 1983 WAVE Study were that the energy shortage is declining in importance as an issue, but the cost of energy is increasing in importance. In 1982 and 1983, 50% of the respondents agreed that "the energy crisis was a hoax" (versus 37% in 1979), and fewer now believe that people will need to use less energy in the future, although using less is seen as the way to counter rising

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[1] A Survey of the Canadian Public's Attitudes Towards the Energy Situation, Volume II, June 1982 and 1983, Consumer and Corporate Affairs, Canada.

[2] The WAVE studies also provide an opportunity to examine actual and perceived price trends. These are included as an Appendix to the Chapter.

prices. Continually since 1976, at least 90% of respondents have stated that individual efforts to conserve energy are very or somewhat important. As compared to 1980, a peak year for individuals claiming to take particular energy conservation actions such as turning down thermostats and switching off lights, fewer conservation activities are reported. However, there are exceptions. The report points out that people are driving fewer miles per year, and car size is, on average, decreasing.

Further, although mean daytime temperatures of houses in 1983 are the same as in 1980 (approximately 67.1 degrees), mean night-time temperatures have dropped from 66.1 degrees to 64.6 degrees.

The Low Income Segment

Unfortunately, an income breakdown is not available in the WAVE data for many items for which there are total population trends. Nonetheless, the WAVE report does provide information on some factors broken down by income. While the lowest income category for 1982 and 1983 is "below $15,000," several interesting results will be highlighted here.

Attitudinally, the lower income people tend to be more "hostile" (an index composed of five of the survey questions) to business and government on the nature of the energy problem. These results are consistent with the results obtained with the ECCP data. Lower income respondents (below $15,000), as compared to higher income ones, perceive a greater need to conserve energy and agree more that mandatory regulations are more effective than voluntary programs.

The WAVE Study for 1983 reported that lower income people tend to do more in-home and transportation energy-conserving activities, but did

not give a breakdown of the actual activities included in these indices. The conclusion coincides with the conclusions drawn from the ECCP study. The 1982 WAVE study reported a significant difference in lower income respondents saying that they used less hot water (55% vs 51% for the overall sample) and that they drove less (76% vs 59% overall). However no significant differences were reported in the percentage turning lights off more often (85%) or turning down the thermostat.

ECCP TABLES

Table ECCP.1

Sample Size and Percent of Sample in Each Category

	Employed		Retired	
	Size	Percent	Size	Percent
H	1131	57.2	58	2.9
M	344	17.4	113	5.7
L	150	7.6	116	5.9
VL	45	2.3	22	1.1

Table ECCP.2

Mean Age of Head of Family

	Employed	Retired	
H	45.0	69.3	
M	45.5	70.2	
L	46.6	70.0	
VL	50.0	70.1	(19)

In this table and in subsequent tables, whenever the sample size is less than 30 in a given cell, the actual cell sample size is in brackets following the response in the cell.

Table ECCP.3

Mean Family Size (# Living in Household)

	Employed	Retired	
H	3.6	2.3	
M	3.9	2.2	
L	4.3	2.3	
VL	4.6	3.0	(22)

Table ECCP.4

Percent with Male Employed Full-Time

	Employed		Retired
H	92.9		
M	80.8		0
L	68.0		
VL	53.3	(24)	

Table ECCP.5

Percent with Female Employed Full-Time

	Employed		Retired
H	27.1		
M	12.8		0
L	12.0	(18)	
VL	6.7	(3)	

Table ECCP.6

Percent with Male Education Over High School

	Employed		Retired	
H	50.3		55.1	
M	29.9		26.3	
L	26.4		14.4	(16)
VL	22.7	(7)	10.0	(2)

Table ECCP.7

Percent of each Income/Employment Group in Cities
(a) Over 1,000,000 (b) Under 10,000 People

	Employed				Retired			
	Over 10,000,000		Under 10,000		Over 1,000,000		Under 10,000	
H	30.6		26.6		27.6		24.1	
M	20.3		39.0		23.0		52.2	
L	14.7		48.7		18.1		43.1	(26)
VL	20.	(28)	62.2	(12)	13.6	(11)	49.9	(6)

Table ECCP.8

Percent of Each Income/Employment Group in Each of Five Regions

Employed

	B.C.	Prairies	Ontario	Quebec	Atlantic
H	14.3	15.5	41.1	20.9	8.2
M	6.4 (22)	18.6	35.2	27.3	12.5
L	7.3 (11)	22.7	30.7	30.7	8.7 (13)
VL	11.1 (5)	17.8 (8)	13.3 (6)	46.7	11.1 (5)

Retired

	B.C.	Prairies	Ontario	Quebec	Atlantic
H	15.5	19.0	43.1	19.0	3.4
M	15.0	14.2	43.4	14.2	13.3
L	19.8	19.8	32.8	13.8	13.8
VL	4.5 (1)	27.3 (6)	22.7 (5)	27.3 (6)	18.2 (4)

Table ECCP.9

Mean House Age

	Employed	Retired
H	21.7	34.8
M	28.0	36.3
L	32.8	40.0
VL	39.6	42.3 (21)

Table ECCP.10

Mean # of Rooms

	Employed	Retired
H	7.7	7.4
M	7.3	7.1
L	7.1	6.6
VL	7.6	6.8 (22)

Table ECCP.11

Mean # of Autos

	Employed	Retired
H	1.7	1.5
M	1.5	1.2
L	1.6	1.0
VL	1.3	1.1 (21)

Table ECCP.12

Mean # of Cylinders per Auto

	Employed	Retired
H	6.8	6.9
M	6.9	6.8
L	7.0	6.9
VL	7.3 (19)	6.9 (12)

Table ECCP.13

Mean Weekly Miles Commuting

	Employed	Retired
H	113	11
M	80	5
L	77	5
VL	64 (18)	13 (19)

Table ECCP.14

Mean Weekly Total Miles

	Employed	Retired
H	300	190
M	239	164
L	281	131
VL	273 (26)	133 (13)

Table ECCP.15

Mean Gallons per Year

	Employed		Retired	
H	369		273	
M	340		279	
L	361		222	
VL	364	(17)	286	(12)

Table ECCP.16

Energy Conservation is Most Important Problem Today

	Employed		Retired	
H	3.53		3.89	
M	3.62		3.92	
L	3.63		3.86	
V	3.25	(28)	4.39	(18)

Table ECCP.17

The Whole "Energy Issue" is a Fad

	Employed		Retired	
H	2.39		2.19	
M	2.65		2.42	
L	2.95		2.51	
VL	2.95	(29)	2.88	(17)

Table ECCP.18

I Read a Lot About Energy Conservation

	Employed		Retired	
H	3.86		4.39	
M	3.63		4.23	
L	3.77		4.43	
VL	4.14	(28)	3.88	(17)

Table ECCP.19

Consumers Alone Can't Do Much About the Energy Situation

	Employed		Retired	
H	2.43		2.59	
M	2.70		2.46	
L	2.83		3.01	
VL	2.55	(29)	2.52	(17)

Table ECCP.20

Energy Use Can be Reduced

	Employed		Retired	
H	4.18		3.76	
M	4.11		4.29	
L	3.87		4.01	
VL	4.24	(29)	4.38	(16)

Table ECCP.21

Soon Everyone Will Have to Use Less Energy

	Employed		Retired	
H	4.61		5.04	
M	4.57		4.68	
L	4.57		4.67	
VL	4.07	(27)	5.28	(18)

Table ECCP.22

People Would Consume Less if the Government Passed Laws

	Employed		Retired	
H	3.34		4.24	
M	3.29		3.77	
L	3.30		3.55	
VL	3.03	(29)	3.17	(18)

Table ECCP.23

Government Spends Too Much on Energy Conservation

	Employed		Retired	
H	2.87		2.77	
M	3.21		3.02	
L	3.19		3.17	
VL	3.10	(29)	3.24	(17)

Table ECCP.24

I Resent Utilities and Government Asking Me to Conserve

	Employed		Retired	
H	3.03		2.64	
M	3.47		3.36	
L	3.48		3.21	
VL	2.90	(29)	3.59	(17)

Table ECCP.25

I'm Not Willing to Go Out of My Way to Conserve Because Conservation is the Government's Job

	Employed		Retired	
H	2.32		1.85	
M	2.60		2.44	
L	2.34		2.51	
VL	2.61	(28)	3.06	(17)

Table ECCP.26

Most Businesses Make Little Effort to Conserve Energy

	Employed		Retired	
H	3.79		3.87	
M	4.13		4.15	
L	4.33		4.33	
VL	4.14	(29)	4.75	(16)

Table ECCP.27

Businesses Waste More Energy

	Employed		Retired	
H	4.39		4.51	
M	4.75		4.82	
L	4.95		4.97	
VL	4.96	(27)	5.82	(17)

Table ECCP.28

Companies Take Advantage of Energy Crisis to Increase Profits

	Employed		Retired	
H	4.44		4.28	
M	4.77		4.62	
L	4.90		4.90	
VL	4.34	(29)	4.17	(18)

Tables ECCP.29

If Live Near Bus and It Goes Near Destination, Should Use the Bus

	Employed		Retired	
H	3.87		4.30	
M	4.21		4.72	
L	4.15		4.65	
VL	4.76	(24)	5.06	(16)

Table ECCP.30

Cars Should Have to Have at Least One Passenger When Going to Work

	Employed		Retired	
H	2.44		3.57	
M	2.58		3.35	
L	2.59		3.80	
VL	2.55	(29)	3.56	(18)

Table ECCP.31

Mean Appliance Energy Index

	Employed	Retired
H	3271	2874
M	2819	2536
L	2828	2358
VL	2801	2225 (22)

Table ECCP.32

Owning a Manual Defrost Refrigerator

	Employed			Retired		
	Already	Willing	Not Willing	Already	Willing	Not Willing
H	20.2	42.3	37.6	21.4	42.9	35.7
M	32.6	38.7	28.7	36.7	37.8	25.6
L	42.0	28.0	30.0	36.9	34.5	28.6
VL	46.4 (13)	35.7 (10)	17.9 (5)	47.1 (8)	17.6 (3)	35.3 (6)

Table ECCP.33

Willing to Cut Lawn with Manual Mower

	Employed			Retired		
	Already	Willing	Not Willing	Already	Willing	Not Willing
H	8.4	51.6	40.0	10.0	40.0	50.0
M	13.8	47.8	38.4	10.1	41.8	48.1
L	15.1 (17)	44.1	40.9	15.3	48.6	36.1
V	29.0 (7)	36.0 (9)	36.0 (9)	21.4 (3)	28.6 (4)	50.0 (7)

Table ECCP.34

Willing to Hang Clothes to Dry

	Employed			Retired		
	Already	Willing	Not Willing	Already	Willing	Not Willing
H	33.6	55.5	10.8	55.3	44.7	0
M	40.4	49.8	9.8	52.3	37.5	10.2
L	58.2	37.4	4.4	66.7	29.5	3.8 (3)
VL	57.7 (15)	38.5 (10)	3.8 (1)	58.8 (10)	35.3 (6)	5.9 (1)

Table ECCP.35

Willing to Use Cold Water to Wash Clothes

	Employed			Retired		
	Already	Willing	Not Willing	Already	Willing	Not Willing
H	21.2	54.3	24.5	11.9	54.8	33.3
M	25.9	49.4	24.7	11.4	50.0	38.6
L	28.0	46.2	25.8	20.3	44.3	35.4
VL	26.9 (7)	38.5 (10)	34.6 (9)	50.0 (7)	21.4 (3)	28.6 (4)

Table ECCP.36

Willing to Reduce Temperature on Water Heater

	Employed			Retired		
	Already	Willing	Not Willing	Already	Willing	Not Willing
H	19.3	69.4	11.3	17.8	77.8	4.4
M	23.5	64.6	11.9	27.3	59.1	13.6
L	25.7	60.4	13.9 (14)	29.3	57.3	13.4 (11)
VL	22.2 (6)	70.4 (19)	7.4 (2)	26.7 (4)	53.3 (8)	20.0 (3)

Table ECCP.37

Willing to Add Insulation to Water Heater

	Employed			Retired		
	Already	Willing	Not Willing	Already	Willing	Not Willing
H	17.9	76.2	5.9	26.8	63.4	9.8
M	21.7	68.3	10.0	31.3	57.5	11.3 (9)
L	25.0	66.3	8.7 (8)	27.4	65.8	6.8 (5)
V	35.7 (19)	60.7 (17)	3.6 (1)	45.5 (5)	45.5 (5)	9.1 (1)

Table ECCP.38

Percent Yes - Close Off Rooms in Winter

	Employed	Retired
H	21.3	34.5
M	19.9	29.5
L	19.3	28.2
VL	25.6 (6)	27.3 (11)

Table ECCP.39

Mean Thermostat Setting

	Employed	Retired
H	67.82	67.84
M	68.20	68.51
L	68.32	67.97
VL	68.63	69.66 (18)

Table ECCP.40

Total Btu Consumption

	Employed	Retired
H	14575	14519
M	13491	11166
VL&L	14193	13917

Table ECCP.41

Total $ Consumption

	Employed	Retired
H	704	690
M	665	612
VL&L	691	535

Table ECCP.42

Mean $/Year on Oil for Oil Users

	Employed	Retired
H	455.0	446.2
M	433.4	416.2
VL&L	463.1 (26)	399.1 (20)

Table ECCP.43

Mean $/Year on NG for NG Users

	Employed	Retired
H	378.9	329.0
M	353.2	360.0
VL&L	367.5	318.9

Table ECCP.44

Mean $/Year on Electricity for Electricity Users

	Employed	Retired
H	369.2	273.3
M	339.9	279.0
VL&L	361.9	231.5

APPENDIX ON ENERGY PRICE AND PERCEPTIONS

The WAVE reports also allow us to examine the actual and perceived trends in energy prices over the time period 1979-1983. As can be seen in Table WAVE.1, for all energy sources except electricity, cost increases have exceeded those of the Consumer Price Index. The greatest increases occurred in 1981 or 1982. As shown in Table WAVE.2, perceptions of cost increases for the four fuels studied (heating oil, electricity, gasoline, and natural gas) peaked in 1982. While the level of perceived price increases declined in 1983, that was the first year in which perceived price increases exceeded the actual price increases for all four fuels. This suggests that a lagged effect occurs in people's perceptions of the level of actual fuel price changes.

Table WAVE.1

Actual Fuel Cost Increase in Past 12 Months (1979-1983)

Energy Source	Average Percentage Increase				
	1979	1980	1981	1982	1983
Fuel oil and other liquid fuels[a]	N/A	19.5	39.6	29.6	12.8
Electricity[a]	N/A	8.0	9.7	10.6	8.5
Gasoline[a]	N/A	19.0	9.6	27.5	12.6
Piped and bottled gas[a]	N/A	7.5	26.8	28.5	12.2
Water, fuel, and electricity[a]	8.6	10.9	22.9	21.4	11.0
Energy[b]	6.9	16.0	30.0	19.8	N/A
Consumer Price Index[b]	8.9	9.0	12.0	11.4	8.3

[a]Increase calculated on a March to March basis.

[b]Increases calculated on an annual basis.

Table WAVE.2

Perceived Fuel Cost Increase in Past 12 Months (1979-1983)

Energy Source	Average Percentage Increase				
	1979	1980	1981	1982	1983
Heating Oil	15.2	16.5	19.0	24.9	20.7
Electricity	14.7	13.0	14.0	18.5	15.8
Gasoline	14.7	17.6	19.9	29.8	24.9
Natural Gas	14.6	14.1	16.7	22.2	19.7

CHAPTER 4

CHIP DATA

In October and November of 1981, a stratified random sample of the Canadian population was surveyed as part of a project involving an evaluation of CHIP (Canadian Home Insulation Program). Although the CHIP data set was not available for analysis, contact was made with the researchers who had originally analyzed the data. They had prepared a series of reports analyzing various aspects of CHIP, including the testing of a number of multivariate models to determine the importance of a variety of personal and household characteristics on energy conservation.[1] In particular, they sought to determine responsiveness to the CHIP program. The following focuses on the importance of income, one of these variables tested in the regression and regression-like models used in the CHIP reports.

As discussed with the ECCP data, income can have indirect effects on energy consumption, through its influence on variables affecting consumption. It is important to note with the CHIP data that the effect of income was assessed in these models controlling for other variables. Thus, the analysis of this data set did not focus on the development of

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[1] Market Analysis Task of the Chip Evaluation Project: Conservation Barriers Model (February 9, 1982), Chip Participation Model (January 25, 1983), and Future Insulation/Conservation Intentions (February 15, 1983).

[2] Other characteristics (e.g. fewer rooms) are associated with lower energy consumption.

a full profile of the low income group. It also focussed on a particular program, CHIP. Consequently, the CHIP data set enabled an investigation of income effects on awareness and participation in a particular program. The CHIP data set also offered an opportunity to verify whether the income effects on energy attitudes and behaviour uncovered from the other data sets could be supported with different data, collected with a different methodology.

CHIP Awareness and Participation

The lower income groups (under $10,000) were generally less aware of CHIP than higher income groups. The lower income groups were also somewhat less likely than those in the middle income group to actually participate in CHIP. In summary, lower income groups are both less aware of CHIP and less likely to have used CHIP.

CHIP Related Energy Attitudes

The attitude questions in the CHIP data focussed on whether there were particular attitudes which could act as barriers to participation in CHIP. Two low income groups were identified in the data--those earning under $6000, and those earning between $6000 and $10,000 per annum.

Overall, these groups do not differ significantly from those in higher income groups in their participation in energy conservation activities, a result consistent with that for the Statistics Canada data. However, the less than $6000 group was more likely than other groups to feel the impact of increased energy prices. This group, with the $6000-$10,000 group, looked to government grants to help them out

and they were, in general, less likely than higher income groups to view government grants as handouts. The lowest income group also had a positive attitude toward the insulation industry, and those in the less than $6000 and $6000-$10,000 categories perceived lower risk in conservation activity than did those in higher income groups.

While these responses might suggest a positive attitude to conservation and a potential receptivity to government conservation programs, the low income groups did not feel that insulation, or other energy-saving devices, were currently affordable. And in addition to the financial barriers to conservation, there may be knowledge barriers to conservation. It is interesting to note that low income groups feel they are more knowledgeable about conservation than do higher income groups feel about their own knowledge. Thus, the low income may feel that they already know about insulation and conserving energy in the home, and therefore are more difficult to influence with new energy conservation measures.

Summary

The CHIP data suggests that the lower income are as concerned as any others about conservation. However, although they may not think conservation is affordable, they do already feel knowledgeable about what they can do to save energy. They may therefore not attempt to become aware of programs like CHIP, and in turn it may be difficult to inform them about energy conservation procedures and initiatives. In the particular case of CHIP, lower income groups are less likely to be aware of and to have participated in this program.

CHAPTER 5

EIPS

The 1978 and 1980 EIPS (Energy Information at Point of Sale) surveys sampled appliance buyers in stores in Western Canada to obtain information on refrigerator and freezer purchasers. At the same time the effects of labels containing different kinds of energy information placed on the appliances were also assessed. The focus of the following investigation is on the low income (under $10,000 annual earnings) group in this sample; however, there were only 28 people (sample size = 279) in the low income bracket in the sample.[1] This can be explained by the fact that, as the earlier Statistics Canada data showed, low income people are much less likely to purchase new refrigerators or freezers than those in higher income brackets. The reader is cautioned that the small sample size of the low income purchasing segment means that great care is needed in generalizing the results.

Although the sample sizes per cell were even smaller when the low income segments were split into employed and retired subgroups, the data were analyzed in much the same manner as was the ECCP data. Four income and two employment catagories were identified, but rather than adjust incomes for family size and town and city size (due to a lack of full information to make such adjustments),

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[1] The 1980 EIPS data contained an even smaller (n =20) sample, and frequently less than that number answered a given question. Although not reported, analysis of trends as a function of income in the 1980 data showed nothing to contradict the findings of the analysis of 1978 data.

the actual dollar income levels were utilized. The same income categories (less than $5000, $5000-$10,000, 10,000 - $15,000, over $15,000 per annum) were used in both EIPS data sets.

Refrigerator Purchase - 1978 EIPS Data

Demographically, there was some variance between groups as function of income. The under $10,000 respondents had smaller than average household sizes, mostly due to the larger number of retired people in that group. There was also a greater percentage of people with only primary school education in the lower income categories.

Regarding purchase, similar to the ECCP data earlier, those earning under $10,000 (employed and retired) were somewhat more likely to buy manual defrost refrigerators. Table 5-1 shows 5 out of 28 purchasers, or 17.9% of those earning under $10,000 per year, bought manual refrigerators, while only 20 out of 251 buyers, or 8.0% of those in the over $10,000 bracket, purchased this type. Although this implies that low income people buy less energy-consuming refrigerators, it cannot be concluded that they are more energy conscious. Rather, it is more likely that manual defrost models are cheaper, and hence more affordable, for those with low incomes.

Support for this conclusion can be found in the attitudinal questions. In assessing their overall attitudes to conservation, the low income groups were attitudinally quite similar to the higher income groups. As a factor affecting purchase, there is a tendency for operating costs and low price to be considered a little more important in lower income groups (Table 5-2). However, neither factor was considered among the 5 most important attributes. In addition, the differences between the income groups are quite small for low price, operating

costs, and some of the other factors affecting purchase. Moreover, the results should be interpreted with caution given the small sample size, expecially in the under $5,000 group. It is also important to note that the question asked was a general one and related to the factors considered important in selecting a refrigerator. It is therefore not clear, for example, whether in responding to the factor low price, a low income respondent who had planned to buy a manual refrigerator was comparing only the price difference between brands of manual refrigerators or between manual and frost free regrigerators when responding to the question. No question directly assessed the importance of the price difference between manual and frost free models. Nevertheless, there is some evidence from examining the income breakdowns within the employed and retired groups that initial price was a consideration. While both groups - high and low income - felt that refrigerators were different in operating costs, the lower income employed group (data not shown) was less willing than the higher income employed group to pay more at time of purchase even if this was offset by lower operating costs in the future. The retired segment on the other hand, showed no such income effects and were generally willing to pay less than the employed segment to save operating costs. The income effect for the employed mirrors the concern expressed in the COSP data (in the next chapter) by the low income segment regarding the capital costs of goods even when the energy efficiency of those goods saved money in the longer run.

Regarding in-store effects, those in the lower income group were more likely to consider advice of the salesperson as important (Table 5-3). Further, they were less likely to notice the energy labels (10% for the low income versus 30% for the high income catagory). This suggests the importance of the salesperson in influencing lower income people to purchase energy efficient appliances.

Freezer Purchase - 1980 EIPS Data

As was the case with refrigerators, very few people among the purchasers of freezers sampled earned under $10,000 annually. The demographic characteristics - education, household size, and so on - were similar to those identified in the refrigerator study.

The freezer data also showed that salesperson advice was rated as more important as income fell, suggesting that those in the low income had less personal knowledge on which to base a decision. The same result held for refrigerators.

It is important to note that there was no relationship between income and the energy consumption of the freezer purchased. The likely explanation is that there is no clear tie between the price of a freezer and its energy efficiency. That is, if a major motivation of low income buyers is to buy cheaper freezers, they would not necessarily be buying the most efficient.

Comparison of refrigerators and freezers suggests the following pattern. For refrigerators, where low price and energy efficiency are linked, low income households are found to purchase energy efficient products. For freezers, where low price is not linked with energy efficiency, buyers' income is not related to the efficiency of product purchased. The implication is that among low income households initial price considerations dominate energy efficiency considerations.

TABLE 5-1

NUMBER BUYING FROST-FREE AND MANUAL DEFROST REFRIGERATORS

INCOME	FROST-FREE	MANUAL
Under $5000	7	0
$5000 - $10,000	16	5
$10,000 - $15,000	31	2
Over $15,000	200	18

TABLE 5-2

MEAN RATING AND RANKING OF SELECTED ATTRIBUTES AMONG REFRIGERATOR PURCHASERS

(Employed and Retired combined).

(1 = Not Important at all to 5 = Extremely important)

ATTRIBUTE	UNDER $5000	$5,000 -$9,999	$10,000 14,999	$15,000 and above
Warranty	5(1)[a]	4.5(1)	4.8(1)	4.3(2)
Type of Defrost	5(1)	4.0(4)	4.8(2)	4.4(1)
Storage Capacity	5(1)	4.4(2)	4.5(3)	4.0(3)
Operating Costs	4.4(11)	3.7(9)	3.7(11)	3.0(15)
Purchase Price	3.4(16)	3.8(7)	3.6(13)	3.4(10)
SAMPLE SIZE	6	19	33	212

[a]Respondents were asked to rate the importance of 19 attributes in their purchase decision. The number in parenthesis is the ranking of the attribute based on its mean importance rating.

TABLE 5-3

RATINGS ON "SALESMAN'S ADVICE WAS VERY IMPORTANT"

	EMPLOYED	RETIRED
Under $5000 (6)[a]	4.50	3.40
$5000 - $10,000 (19)	3.22	3.67
$10,000 - $15,000 (33)	3.26	2.62
Over $15,000 (212)	2.75	3.00

(Scale: 1 = strongly disagree; 5 = strongly agree)

[a]sample size

CHAPTER 6

COSP

In 1981, a survey was carried out of participants in COSP (Canadian Oil Substitution Program), who had converted from oil to gas as a heating fuel. In addition, a sample of homeowners who had not converted was also surveyed at the same time with a similar questionnaire. With the cooperation of the researchers who carried out the study, a comparative analysis of 1056 converter respondents and 387 nonconverter respondents was conducted. The lowest income category represented in this survey was $10,000 or less. The analysis here was concentrated on comparing responses of low income people who had converted to gas to low income people who had not converted to gas. The goal was to detect similarities and differences among low income converters and nonconverters to see if we could better understand why some low income people converted while others did not. Consequently, all data in this chapter are for low income respondents. There were 97 employed and 60 retired converter respondents and 39 employed and 24 retired nonconverter respondents in the low income category.

Demographics

Table COSP.1 provides background information on the low income respondents in the COSP Study. Eighty to 90 percent of respondents live in single family houses, with mobile homes or duplexes being second. Converters' homes are younger than those of nonconverters by 8 years for working and 37 years for retired respondents. Working-converters'

houses have fewer people on average (2.35 versus 2.84) than do non-converters, but retireds, whether converters or not, have about 2 people on average. Converters' homes are smaller than nonconverters homes, retired nonconverters having the largest ones.

There are no significant age differences between converters and nonconverters, and there is about a 20 year spread between retired and working respondents on average (Table COSP.2). On the other hand, and very surprisingly, converters are less educated than nonconverters (Table COSP.3). The result is contrary to intuition and deserves further investigation.

Table COSP.4 shows the first and second largest occupation groups for the converters and nonconverters. As would be expected with a low income segment, the predominant occupation for workers is laborer for men, being 56.3 percent of respondents for converters and 32.3 percent for nonconverters.

Table COSP.5 indicates that the survey was carried out in four provinces. The breakdown by provinces points to a more even distribution across Canada for surveyed low income converters than exists in the actual population. Although this geographic distribution is due to the sampling plan used by the researchers, a detailed analysis of the actual distribution of COSP grants may well be worthwhile. In contrast, the sampling for nonconverters appears to be different. Fifty percent of retired nonconverters are from British Columbia; similarly, 51.3 percent of working nonconverters sampled are from Ontario.

Energy and Conservation Views

Table COSP.6 shows the general energy views of respondents. Converters see a greater possibility of future energy shortage problems, but the difference is not strong. They are further equally as likely as non-converters to agree that an individual's effort can have an effect on such a shortage, and that Canadians are likely to make such an effort (the exception is in retired-nonconverters, who feel less that the individual is important). Yet despite these similarities, converters believe more that they are doing more than their fair share--they presumably think others could do more to even out the conservation load across everyone.

Table COSP.7 shows that adding insulation was felt by all the low income groups to be the primary activity which could be undertaken to reduce energy costs in the home (75-80 percent agreement). Differences between groups appeared in the second choice. Converters felt that the second most preferred saver would be conversion of the home heating system to a non-oil source (about 50 percent of converters). In the nonconverting group, employeds felt caulking or weatherstripping should be next (46.4 percent), while retireds preferred turning down the thermostat at night. Clearly each of these actions has visible benefits, but are viewed quite differently by the different groups. This is highlighted by the fact that one-third of nonconverters felt changing away from oil was the worst cost reduction activity, while half of converters felt it was best.

Reasons for Converting or Not Converting

Table COSP.8 looks at possible factors contributing to the decision to convert from oil. In some instances, converters and nonconverters agreed on the importance of these factors. For instance, they agreed that capital costs played a primary role, and that expecting a move in the future or system availability were not important issues in the decision.

But more often they disagreed, and the primary source of disagreement was monetary. Converters rated as not important the possible lack of a sufficient government or utility grant to finance the project were not important, that is, they have the financial means to do a conversion. Nonconverters, on the other hand, stressed the lack of availability of financial help as important, and further saw interest rate levels as important. Nonconverters were more likely to cite having invested in other conservation measures. (It should be remembered that the COSP data allowed for only a broad definition of low income [earning $10,000 or less]; a further breakdown of low income in future research might examine whether low income converters had higher incomes than low income non-converters.)

Looking specifically at converters, there are also differences between the working and retired segments (Table COSP.9). In general, the retired are more motivated by a fear of an energy shortage but less by their older system's condition than are the working converters. Yet the two groups do agree on the three major issues:

(1) Current heating costs are high;

(2) They are concerned about future heating costs;

(3) They see loan availability as important.

Looking at Table COSP.10, these reasons are also responsible for the choice of fuel, with little disagreement between the two groups overall. Money is clearly a prime motivating factor. This is supported by the result in Table COSP.11, which shows the primary reason for nonconverters not converting was inability to afford the change. Satisfaction with the current system came second. Interestingly, retired respondents disagreed that they could afford their current heating costs. This paradox, of not being able to afford the costs of reducing energy costs, certainly puts them in a frustrating position.

Fuel Beliefs

Not surprisingly, low income converters tended to view gas much more favorably than did low income nonconverters (Table COSP.12). Converters tended more to see gas as being safer, receiving prompt service, being a reliable supply, and requiring inexpensive equipment. There was little difference between working and retired respondents within this group. In some cases, such as supply reliability, and equipment cost, nonconverters placed gas second best, but for safety and promptness of service gas came last on their lists. Interestingly, even converters placed gas as second in cleanliness of operation, although 41.7 percent did place it first (ahead of electricity!). Finally, even nonconverters placed gas as number one in low heating costs.

All this points very strongly to the non-monetary considerations which consumers say they take into account in making a conversion decision. If cost of heating was the only consideration, gas would be the preferred fuel, but as Table COSP.13 points out, even with converters, over half the respondents prefer oil or electricity. There-

fore, monetary considerations may help some people overcome a personal preference for oil and electricity and result in conversion to gas. Perhaps fuel preferences could be changed by addressing the fears (safety) or beliefs (equipment costs) associated with using gas.

COSP Grants

Table COSP.14 shows the awareness of respondents of various features of COSP grants. With the exception of being able to keep oil capability, converters were significantly more aware of the features. They were most fully aware of the 50 percent coverage of costs and that application for the grant is done after conversion. There was slightly lower awareness that the grant could be applied to different types of fuels and that the grant could be treated as income. Nonconverters were most fully aware of the amount of the grant, but were generally only vaguely aware of the other salient features. In both groups, the fact that oil can be maintained is not well known.

With respect to how they feel about the grant (Table COSP.15), all groups felt that the 50 percent of costs covered is its best feature. Not surprisingly, people were less positive to being taxed on the grant. Yet even though money appears to be a major issue, there is mild agreement amongst both working and retired converters that they would have converted even if the grant had not been available--the grant may have simply induced them to convert earlier than they would have otherwise.

Significant differences between groups can be seen in their sources of information on the COSP grant (Table COSP.16). Working converters saw newspapers as most important (81.8 percent used them), with radio,

magazines, T.V.s, and friends grouped in second place (at about 60 to 70 percent usage each). Retired converters had relied most on newspapers, T.V., magazines and radio (from 77 down to 60 percent reliance), with friends much less important (38.0 percent). For nonconverters the general trends were the same, although there was variation from converters in both directions. The one anomaly was that retired nonconverters, but not the retired converters, emphasized friends as a source of information.

Overall, as Table COSP.17 points out, there is great diversity in opinion over what is the best source. Magazines appear to have an edge, but no single source is cited by a majority of any segment.

Insulation Attitudes

As a gauge on conservation attitudes, respondents were asked how well they felt their houses were insulated (Table COSP.18). Two trends are apparent. First, both the retired and working converters, overall, felt better about their house insulation than nonconverters. Second, all groups felt that their basements were fairly poorly insulated, but that the walls were adequate and the attic was quite well insulated.

These feelings are reflected in Table COSP.19, which shows that respondents had limited plans to add insulation to their homes. Nonconverters were slightly more likely to be planning to add insulation, but even they were not working with a specific time horizon in mind. This similarity between converters and nonconverters is somewhat surprising. Table COSP.7 had earlier indicated that adding insulation was the preferred energy conserving alternative for all the groups.

Therefore some barriers to actually adding insulation would seem to have to be overcome before that behaviour is adopted.

CHIP and Enersave Awareness

In the working segment, converters are somewhat more likely than nonconverters to be aware of the CHIP grant, to be eligible for it, and to apply for it (Table COSP.20). Oddly, the reverse is true for the retired segment, where nonconverters seem to be more aware. This latter fact possibly occurs because CHIP is related to older homes; as Table COSP.1 indicates, the retired nonconverters have significantly older homes than other segments.

Awareness of the ENERSAVE program was much lower (45 percent) than that of CHIP, although converters still were somewhat more likely to be aware of it than nonconverters (Table COSP.20). This points out the varying levels of of the various programs with an even greater difference in the number of people actually applying for the various programs.

COSP.1 Demographic Description of Respondents' Homes

	Working		Retired	
	C	NC	C	NC
a) Type of Houses - Percent	86.7	78.9	88.1	91.3
b) Mean Age of House (in years)	38.7	46.8	40.5	77.1
c) Mean Number of Rooms	6.9	6.5	5.2	6.2
d) Mean Number of Persons	2.35	2.84	2.08	1.95
e) Mean Square Footage where: 1 = less than 500 sq. ft.; 2 = 501-800; 3 = 801-1000; 4 = 1001-1200; 5 = 1201-1500; 6 = 1501-2000; 7 = more than 2000 sq. ft.	3.11	3.70	3.12	4.09

Note: C represents converter; NC represents nonconverter. Data in this table and for all others in this chapter are for low income resondents only.

COSP.2 Respondent Age by Sex

	Working		Retired	
	C	NC	C	NC
Male	3.8	4.0	5.7	5.8
Female	4.9	4.1	5.2	5.6

1 = under 25; 2 = 25-34; 3 = 35-45; 4 = 46-54; 5 = 55-64; 6 = over 64

COSP.3 Respondent Education by Sex

	Working		Retired	
	C	NC	C	NC
Male	1.62	2.38	1.69	2.11
Female	1.60	2.93	1.94	2.58

1 = elementary; 2 = some high school; 3 = high school graduate; 4 = college; 5 = some university; 6 = university graduate.

COSP.4 Respondent Occupation by Sex (percent)

		Working		Retired	
		C	NC	C	NC
Male	1st	Labour (56.3)	Labour (32.3)	Retired (79.2)	Retired (94.4)
	2nd	Other (40.0)	Farmer (29.0)	Profes- (12.5) sional	Labour (5.6)
Female	1st	Home- (51.4) maker	Home- (55.2) maker	Retired (58.8)	Retired (86.9)
	2nd	Other (35.1)	Other (24.1)	Home- (23.5) maker	Other (6.7)

COSP.5 Provincial Distribution of Respondents

	Working		Retired	
	C	NC	C	NC
BC	15.3	15.4	26.7	50.0
Manitoba	27.6	15.4	31.7	12.5
Ontario	26.5	51.3	20.0	37.5
Quebec	30.0	17.9	21.7	0.0

COSP.6 General Energy Views

	Working		Retired	
	C	NC	C	NC
Possibility of Energy Shortage a Serious Problem	2.26	2.38	2.17	2.58
Individual Actions Can Make Important Contributions	1.66	1.64	1.63	1.91
Canadians are Very Likely to Make Voluntary Efforts	1.97	2.07	2.00	2.33
I do more than my fair share	2.04	2.25	1.98	2.08

*Scale ranged from 1 = Strongly Agree to 5 = Strongly Disagree

COSP.7 Preferred Energy Cost Reduction Activities

	Working		Retired	
	C	NC	C	NC
First Choice	C (71.6)	C (75.0)	C (75.6)	C (80.0)
Second Choice	E (47.7)	B (46.4)	E (52.4)	D (50.0)

C = Adding Insulation; B = Caulking; D = Turn Down Thermostat;
E = Change Heating System

COSP.8 Importance of Reasons for not Converting

	Working		Retired	
	C	NC	C	NC
Capital Costs	2.17	2.17	2.21	1.94
Interest Rates	2.76	1.96	2.93	2.00
Move in Future	3.63	3.69	3.61	3.58
Saving Need to Justify	2.97	1.92	2.87	1.77
Invest in Other Measures	2.82	2.37	3.08	2.35
Gov't Grant Insufficient	3.14	1.96	3.24	2.17
Utility Grant Insufficient	3.33	2.03	3.45	2.11
Too Much Bother	3.68	2.92	3.57	2.80
System not Available	3.98	3.88	3.79	3.50

Scale: 1 = Strongly Agree to 5 = Strongly Disagree

COSP.9 Reasons for Converting (Converters Only)

	Working	Retired
Fear of Oil Shortage	2.56	2.24
Present Heating Costs High	1.72	1.77
Previous System Condition Poor	2.75	3.05
Previous System Broken Down	3.68	3.91
Concerned about Future Oil Costs	1.67	1.50
Loan Availability	1.58	1.73
Utility Loan Availability	2.63	2.65
Lower Future Heating Costs	2.07	2.09

Scale: 1 = Strongly Agree to 5 = Strongly Disagree

COSP.10 Reasons for Choice of Fuel (Converters Only)

	Working	Retired
Lower Heating Costs	1.90	1.94
Future Cheap Heating	1.97	2.07
Equipment Costs Less	2.45	2.47
Source Wanted Not Available	3.85	3.68
Government Grant	1.78	1.86
Utility Grant	2.62	2.88
Future Energy Shortage of Other Fuels	2.78	2.51

Scale: 1 = Strongly Agree to 5 = Strongly Disagree

COSP.11 Reasons for Not Converting (Nonconverters Only)

	Working	Retired
Satisfied with Current System	2.09	2.16
Can Afford Current Heating Costs	2.66	3.25
Recently Changed	3.84	3.86
Cannot Afford to Change	1.81	2.11

Scale: 1 = Strongly Agree to 5 = Strongly Disagree

COSP.12 Ratings of Natural Gas (percent rating gas as best, next best, and poorest on criteria)

	Working		Retired	
	C	NC	C	NC
Operates Cleanly				
Best	41.7	17.4	35.9	25.0
Next Best	50.0	78.3	51.3	58.3
Poorest	8.3	4.3	12.8	16.7
Safe to Operate				
Best	31.4	4.5	42.1	25.0
Next Best	27.5	27.3	26.3	16.7
Poorest	41.2	68.2	31.6	58.3
Prompt Service				
Best	53.1	31.8	48.6	58.3
Next Best	24.5	22.7	28.6	16.7
Poorest	22.4	45.5	22.9	25.0
Reliable Supply				
Best	61.5	31.8	63.2	54.5
Next Best	25.0	40.9	18.4	27.3
Poorest	13.5	27.3	18.4	18.2
Inexpensive Equipment				
Best	56.3	31.8	72.2	66.7
Next Best	25.0	40.9	16.7	33.3
Poorest	18.8	27.3	11.1	0.0
Low Heating Costs				
Best	72.9	60.9	97.6	73.3
Next Best	20.8	39.1	0.0	20.0
Poorest	6.3	0.0	2.4	6.7

COSP.13 Overall Rating of Natural Gas (Percent Respondents)

	Working		Retired	
	C	NC	C	NC
Best	47.4	30.3	56.0	50.0
Second	32.9	45.5	32.0	31.8
Poorest	19.7	24.2	12.0	18.2

COSP.14 Awareness of COSP Features

	Working		Retired	
	C	NC	C	NC
Pays 50% of Costs	1.13	1.54	1.09	1.33
Treated as Income	1.41	2.21	1.57	1.53
Conversion to Different Fuels	1.48	1.86	1.49	2.21
Can Keep Oil Capability	2.21	2.08	2.24	2.57
Apply for it After Conversion	1.22	2.14	1.05	1.93

1 = Fully Aware; 2 = Vaguely Aware; 3 = Not Aware

COSP.15 Most Liked and Disliked Features of COSP Grant (percent of respondents)

	Working		Retired	
	C	NC	C	NC
Liked Most (50% Costs Paid)	88.5	77.8	91.3	84.6
Liked Least (Grant is Taxable)	48.0	50.0	75.6	69.2

Note: All groups agreed on the two features as most and least liked--only the strength of response varied between groups.

COSP.16 Sources of Information on COSP

	Working		Retired	
	C	NC	C	NC
1. Magazine Story	68.3	52.4	65.3	75.0
2. Radio	71.1	52.4	60.4	50.0
3. T.V.	62.7	60.0	73.3	92.3
4. Newspapers	81.8	63.6	77.6	90.9
5. Utility Mailing	47.1	26.3	16.3	53.8
6. Private Contractor Mailing	11.1	21.1	14.0	18.2
7. Utility Visit	16.2	15.8	20.8	27.3
8. Contractor Visit	34.3	15.8	27.1	27.3
9. Friends	60.3	52.4	38.0	91.7

COSP.17 Best Source of COSP Information

	Working		Retired	
	C	NC	C	NC
Best Source	16% Magazine 16% Newspaper	38% Friends	20% Newspaper	31% Newspaper

COSP.18 Perceived Adequacy of Insulation

	Working		Retired	
	C	NC	C	NC
Basement	2.04	1.81	2.21	2.38
Walls	2.87	2.51	2.85	2.66
Attic	3.48	3.28	3.60	3.40

where: 1 = Not Insulated; 2 = Poorly Insulated; 3 = Moderately Well Insulated; 4 = Very Well Insulated

COSP.19 Plans to Add Insulation

	Working		Retired	
	C	NC	C	NC
Mean Responses	4.43	4.25	4.70	4.42

where: 1 = Yes, in 1 to 6 months; 2 = Yes, in 7 to 12 months; 3 = Yes, in 12 or more months; 4 = Yes, don't know when; 5 = No.

COSP.20 Awareness of CHIP and Enersave Programs (% Yes)

	Working		Retired	
	C	NC	C	NC
Aware of CHIP	91.8	84.8	80.4	95.0
Eligible for CHIP	58.9	48.5	69.6	78.9
Applied for CHIP	59.0	33.3	43.4	57.1
Aware of Enersave	45.8	44.1	43.1	40.9
Applied for Enersave	10.3	6.3	17.0	10.5
Plan to Apply for Enersave	10.3	21.9	7.5	15.8

CHAPTER 7

LITERATURE REVIEW

Introduction

A literature review was done to supplement the findings of the different data sets analyzed in the previous chapters. The following methods were used in the literature search:

1) A manual search of serial listings, social science indexes, and public service (P.A.I.S.) indexes.

2) An extensive computer search of a U.S. social science databank. This computer search utilized key words such as "low income," "energy," "elderly," "utilities," etc. These key words were cross-referenced and backdated for the previous 10 years. We obtained a listing of eleven studies directly related to the low income and energy.

3) An Annotated Bibliography on consumer energy research, up to and including July 1980. This biblography was compiled by two Canadian researchers, C. Dennis Anderson and Gordon McDougall. However, the bulk of the research studies reported were based in the U.S.

The literature review is therefore primarily based on U.S. research. There are Canadian-American differences in a number of areas e.g. government energy programs, climate, and differences between the two societies overall. This limits to some extent the generalizations that can be applied to Canada, and may account for some of the differences between the results obtained with the Canadian data bases analyzed for this report and those reported in the U.S. studies.

Summary of Main Empirical Findings in Literature

- as income increases, consumption and expenditure on energy also increase
- however, the low income spend up to 10 times the proportion of their budget on energy than the high income groups
- higher income households favor gas over electricity for space heating
- low income households own fewer autos, travel less, buy older vehicles, and hold on to their vehicles longer
- low income families are less likely than higher income groups to change their living patterns when energy prices increase
- two factors correlating with energy consciousness are income and education
- high income more than low income families appear to cut down on their fuel in energy crises
- transport-related energy conservation also increases with income
- the longer the payback period (through energy bill savings) the less likely low income families are to make energy investments in their homes
- though female-headed households are prevalent amongst the low income, there is some empirical evidence that sex has no effect on energy consumption
- the elderly are an important subsegment of the low income and consume less energy than any other age/income group
- larger proportion of low income elderly's (versus other age groups) expenditures on electricity is for essential needs

Summary of Literature

A monotonic, increasing, relationship between income and expenditure on energy consumption is one of the most consistent trends observed in the literature. In one Los Angeles study, it was found that low income households (less than $5000 income) accounted for 31 percent of all households, but only 17 percent of the total electricity consumption. High income groups (+15,000 income) represented 21 percent of all households, but consumed 41 percent of L.A.'s electricity (Berman & Hammer). Numerous studies suggest that although low income people spend less on energy, and experience smaller absolute increases in costs, the expenditures account for a much larger proportion of their disposable income--up to ten times the proportion of higher income groups (King, Cohen, Barth, Warriner). The results of one study indicated that low income households spent an average of more than 11 percent of their income on natural gas and electricity compared to 2 percent for those with higher incomes (Barth). it is obvious that the low income are subjected to a more difficult financial strain as a result of energy expenditures.

Though there is very little literature on the relationship between income and fuel preference, it has been found that higher income households favor gas over electricity for space heating, and electricity over oil for water heating (Baughman & Jaskow). This study also indicated that higher winter temperatures led to a favoring of electricity over gas and oil for heat.

The literature on transport-related energy consumption is more extensive. The higher the income level, the greater the amount travelled. This is directly attributable to the fact that high income groups

use their cars for work-related purposes--whereas a large percentage of the low income are unemployed (Stucker). Low income groups own fewer autos per household, buy older cars, and keep their autos longer (Stucker). They also have a higher propensity to purchase medium or small-sized cars, whereas the higher income groups purchase larger, luxurious, and foreign cars. Regarding actual behaviour to conserve energy, as income increases (up to $30,000) people are more likely to drive more slowly, keep their car tuned and change their shopping habits when they wat to conserve energy (Hartagen et al.) Hartagen concludes that the energy crisis will most adversely affect those people with little or no travel choices, such as low income, rural, people.

As energy conservation becomes increasingly important, there is increasing consumer research on energy-related attitudes and behaviors. It has been found that, in general, low and very high income groups are the least sensitive to energy price fluctuations (Cunningham, Broudel). Consumption of electricity by low income groups is primarily for essentials (e.g. fridges, washers, vaccuums, T.V.s, minimal lighting). In contrast, the very high income group can potentially reduce the use of the greater number of non-essentials they own. However, the very high income group can afford to absorb the increased costs associated with gas or electricity price increases.

The two major factors which are related to the level of energy consciousness are income and education (Tashar, Cohen, Morrison, Barnaby). As income and education level increase, so does the belief in the seriousness of the energy crisis. Low income/low education groups are more likely to believe that individual actions to conserve energy will have limited impact (McDougall, et al.). Barnaby, et al. suggest

that energy consciousness is directly related to one's sources of personal information, and exposure to media (this is also supported by Tashar and Hirst).

There is contradictory evidence regarding energy conservation behavior (or behavioral intentions). One study indicated that while higher socioeconomic status people were more likely to believe in the energy crisis, lower and middle status people were more likely to reduce energy usage. In one specific area, however, Perlman and Warren found that upper income families were more likely to cut down on heating fuel use than lower income families. Nevertheless, they also suggested that there were small differences between income groups, in the conservation of gas and electricity. More importantly, they concluded that, while high income families made the greatest reductions in home-heating use, their average room temperatures remained higher than low income families (Perlman & Warren). This is different from what was obtained from the Canadian data sets analyzed in this report. In general, the literature suggests a variety of factors affect thermostat settings. Higher thermostat settings tend to be associated with households of smaller size, with older, less healthy people, and with people who do not believe in the energy crisis (Rosson & Sweitzer).

Empirical evidence has shown that the financial concerns of low income families have a direct impact on their unwillingness to accept long payback periods for investments in insulation and solar energy equipment through savings in energy bills (Cunningham, et al.). It was shown in this study that the lowest income groups have the shortest perceived payback periods (1.5 years on a $500 investment). As income increases, so does the payback period, with the fourth highest income

group ($15,000-$19,000) having the longest payback (4.5 years on a $500 investment). One can conclude that the low income are not willing to wait long to recover their investment.

One focus of the consumer energy research literature has been female headed households. Various studies have hypothesized that female-headed households are less efficient in their use of energy than male-headed households. However, it has been shown that when one controls for other variables known to affect energy use, sex of household head has no statistically significant independent effect on electricity consumption (Defronzo & Warkov). This generalizes across ethnic and marital status groups. Nevertheless, it is still important to note that there are a large number of single women in the low income group with characteristics associated with possible inefficient energy use.

Elderly

Demographic statistics indicate that the elderly are the largest subgroup of the low income population. U.S. data show that the elderly poor consume less energy than any other income/age group (Bloom, et al.). Warriner's study indicated that the elderly use one-third less electricity than the non-elderly. Furthermore, 81 percent of the elderly's electricity consumption was utilized for essential needs, i.e. lighting, refrigeration, water heating, and cooking. Only 54 percent of the non-elderly's consumption was used for essentials (Warriner).

Though the elderly poor consume less energy than other income groups, and use it for essential needs, they spend a disproportionate amount of their budget for energy (Bloom, et al.). Electricity alone

accounts for 5 percent of the elderly poor's household budget, versus 3 percent for higher income groups (Warriner).

Overall, the elderly are quite different from the non-elderly. The generally positive income/energy relationship has to be modified to some extent to take into account the unique characteristics of both the low and high income elderly segment. For example,

- their homes are older and often mortgage-free.
- they have fewer transport needs, since they are not likely to be employed
- there are usually few child-related expenses, and medical expenses, though higher, are supplemented through medical plans or other means.

Additional disposable income can be channelled into appliances. However, the elderly are no more likely to own energy intensive appliances such as frost-free freezers, partial frost-free, and regular fridges, central and wall air-conditioners, and electric water heaters (Warriner). Moreover, they are less likely to own regular freezers, frost-free fridges, electric ranges, dishwashers, clothes washers and dryers.

The transportation literature suggests other elderly-nonelderly differences. However, in an analysis of three separate surveys taken over a four year period, younger respondents wanted higher fuel economy for autos, while the elderly were less concerned with this problem (Appleby & Hodge). Again, this might reflect the lack of auto ownership and low mileage driven by the elderly.

A focus in future consumer energy research should be on the low income elderly since the proportion of the elderly in Canada is increasing.

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OVERALL SUMMARY AND CONCLUSIONS

The following summarizes the analysis of Statistics Canada data, CCA surveys, and three conservation program studies. Conclusions are presented with regard to: a) main themes in energy consumption by the low income; b) energy program priorities; and c) future research directions.

Summary - Statistics Canada

How many people living in Canada have annual incomes that are less than the LICO (Statistics Canada's Low Income Cut Offs)?

- In 1978 the Canadian population was made up of 5.8 million "family" households (multiple persons) and 1.3 million "unattached" households (single persons). Of the family households 11% (637,000 Households) had incomes below LICO. Of the unattached 36% (470,000 households) were below LICO. In 1982 12% of families and 38% of unattached had incomes less than LICO.

Who are the people below LICO: the elderly? less educated? households without male wage earners? single mothers? larger families? in big cities? in particular regions?

- The answers to all of these suspicions seems to be "yes but no". It is important to retain the family-unattached distinction since there are differences between these two groups.

- For families below LICO roughly 25% are over 65 years of age (compared to 12% for families above LICO). The converse is that the very large majority have not reached retirement age.

- Approximately 33% of low income families have a female household head (compared to less than 10% for families above LICO). On the other hand, two-thirds of below LICO families have male household heads.

- More than 40% of low income families have less than 8 years education. The converse is that at least 10% have more than 12 years.

- The size of the family and the city size do not seem to differ for families below versus above LICO. On the other hand regional differences in percentage of low income families match the general pattern of regional prosperities.

- For the unattached below LICO the difference in age is much more pronounced with close to 50% being over 65 years (compared to roughly 20% for unattached above LICO).

- The female-male ratio is 65:35 (compared to 50:50 for above LICO).

- More than 40% have less than 8 years of education.

- Again there appears to be little distinction by city size, and regional differences match regional prosperities.

What is the housing situation of households below LICO?

- For families below LICO a major characteristic of their housing is that approximately 1/2 are renters. As discussed later this large proportion of renters has two major implications when consider low income and energy issues. First, renters frequently have their heat and light costs included as part of their rent making analysis of these expenses difficult. Second, government conservation programs have, for the most part, been directed at homeowners. This indicates that over 1/2 low income families are unlikely to benefit from these programs.

- Other housing characteristics of families below LICO indicate that their homes are somewhat older and somewhat smaller.

- For unattached below LICO the proportion renting is even higher. More than two-thirds are renters. Their homes are also somewhat older and smaller.

Do households below LICO own fewer appliances?

- Lack of information on renters complicates this question. Rental accommodation frequently provides stoves and refrigerators, possibly washers, dryers, and occasionally dishwashers. Since there are many renters among low income families, there will be the natural outcome of lower appliance ownership.

- For families below LICO the percentage that own major household appliances is consistently lower than for families above LICO. However, it is important to note that the lower appliance ownership among the lower income corresponds to

their higher incidence of living in rental accommodation. In other words, ownership of major appliances per homeowner does not appear to differ much with income.

- For unattached below LICO the proportion of homeowners that owned these major appliances is consistently lower.

Do households below LICO own few automobiles?

- For families below LICO the answer is definitely yes. Approximately 40% own no car (compared to only 10% non owners among the above LICO).

- For unattached below LICO car ownership is even less common, almost three-quarters own no car.

Are low income families able to keep their expenses, particularly energy expenses, in line with their incomes?

- As mentioned earlier, information on energy expenses for renters is problematic since heat and light is frequently included in their rent. Statistics Canada's "Shelter Expense" is the only data that includes all households, and is a summation that includes rents, mortgage interest, electricity bills, maintenance, and whatever else householders pay for their shelter. Comparison of low versus high income households indicates that the low income are not able to keep these shelter expenses in proportion to their incomes. That is, low income families spend a higher fraction of their incomes on shelter.

- For low income families total expenditures are 33% the spending of high income families, however their shelter expenses are close to 50% of the higher income.

- For low income unattached total expenditures are 25% of spending of the higher income, while shelter is again close to one-half.

- Among households that pay for heat and light directly, it is clear that keeping energy expenses in line with income is a major problem.

- Low income families spend roughly 80% as much as high income families for heat and light, while their total expenditures are only 33%.

- Low income unattached spend essentially the same as high income, while their total expenditures are only 25%.

- On the other hand low income households cut their automobile driving by more than would be indicated by their income level. Low income families spend 28% as much as high income families on gasoline, while their total expenditures are 33%. Low income unattached spend only 15% as much as those with higher income on gasoline, while their total expenditures are 25%.

Summary - CCA Surveys

The ECCP research done by CCA made it possible to look specifically at family homeowners -- the target of many conservation programs. This data also made it

possible to segment family homeowners into employed and retired, based on the supposition that low income retired are a special case in that their low retirement incomes may be offset by accumulated equity.

Analysis of the ECCP data indicated that the demographics of low income family homeowners were not substantially different from Statistics Canada's families below LICO. Attention to low versus high income in the employed segment indicated several differences -- a tendency of low income toward larger families, lower education, older homes, the same number of cars but more cylinders, and less miles driven but the same level of gasoline usage.

What are the attitudes of the low income regarding energy conservation?

- Although attitudinal differences were not major, these differences displayed a clear pattern that was divisible into "low income effects" and "retirement effects".

- The differences between low versus high income families indicated that the low income were more skeptical -- more inclined to view the energy issue as a fad, to think government was spending too much on conservation, to resent being asked to conserve more, and to blame business for energy problems.

- The differences between retired and employed families indicated that the retired were more positive toward conservation -- more inclined to consider conservation important, to read a lot about the topic, to believe people will have to do more, to agree that laws would be effective in attaining conservation, and to agree that there should be greater use of public transit.

Have low income families tried to cut their energy consumption?

- Again the ECCP data displayed separate "low income" and "retirement" effects".

- Low income families had fewer appliances, more likely owned a manual defrost refrigerator and manual lawn mower, more likely to hang clothes to dry, to wash clothes in cold water, and more likely to have reduced their hot water setting.

- Retired families also had fewer appliances and were more likely to hang clothes to dry. They were also more likely to close off rooms in the winter, but were less likely to use cold water to wash clothes.

- On balance the low income are making many attempts to reduce their energy consumption. Further, these efforts are amplified when the low income family is retired.

Among family homeowners are those with low incomes able to keep their energy expenses in line with their incomes?

- A major contribution of the ECCP data was the segmentation of employed and retired in the analysis of energy expenditures. This segmentation showed that lower levels of energy spending by low income families were limited to families in the retired segment.

In other words, retired family homeowners with low incomes spend less on electricity; fuel and gasoline than their higher income counterparts.

- Among employed families homeowners spending on electricity, fuel and gasoline does not change with income.

- Attention to factors associated with energy consumption helped to provide an understanding of these energy spending patterns. For example, for in-home energy each of the four income-employment segments was evaluated to identify characteristics that would lower energy expenditures.

- High income Employed -- newer houses possibly more energy efficient, but offset by more rooms and more appliances -- "high" consumption.

- Low income Employed -- many small conservation actions, but offset by larger families -- "high" consumption.

- High income Retired -- small families, close off rooms in winter -- "moderate" consumption.

- Low income Retired -- smaller families, fewer rooms, fewer appliances, close offrooms in winter, many small conservation actions -- "low" consumption.

Summary - Conservation Program Studies

Research focusing on three conservation programs (CHIP, Energuide and COSP) was analysed to assess the reaction of low income households to government

conservation initiatives. Since each program involves a cash outlay on the part of the householder, it was maybe not surprising to find that these programs were used less by the low income than by households with higher income levels.

Does the Canadian Home Insulation Program, CHIP, Serve the Needs of Low Income Households?

Since the information available for analysis was not the complete CHIP evaluation data set, the conclusions are tentative. However, the pattern that emerged from the available data was very interesting and indicated the need for further attention to the complete data set. Preliminary analysis showed the following pattern:

- Low income households were more inclined to feel knowledgeable about conservation

- Low income households reported as many conservation actions as those with higher incomes

- Low income households were more inclined to feel insulation is not affordable

- Low income households were less aware of CHIP

- Low income households were less likely to have used CHIP

As indicated earlier renters are a major segment of low income households. Although CHIP is available to renters, presumably there is less incentive for

this group to add insulation. The success of CHIP in assisting low income renters should be of particular concern in future program analysis.

Does the 'Energuide' Program Serve the Needs of Low Income Families?

The data for the Energuide research was from a sample of refrigerator and freezer buyers, obtained with the cooperation of a national department store. The relatively small proportion of low income households in the sample indicated two factors. First, as indicated by Statistics Canada expenditures data, low income households are less likely to be buying major appliances. Second, low income households may be more inclined to buy second-hand or from discount dealers rather than from national department stores. However, despite the limited sample of low income households a clear picture was evident:

- Low income households gave a higher importance to 'initial price'.

- Low income households were less willing to pay more for lower operating cost.

- Low income households were less likely to notice the Energuide label.

- Low income households were more likely than higher income to buy manual defrost refrigerators. Accordingly, their purchases had better energy efficiency.

- The energy efficiency of freezers purchased by low income households was no different from those purchased by households with higher incomes.

The refrigerator versus freezer comparison was important. With refrigerators the more efficient products are also less expensive. However, this is not the case for freezers. Since the findings showed that low income households purchase refrigerators that are more efficient, but freezers that are not, the primary motivation is clearly low price. Money available at the time of purchase obviously dominates the thinking of the low income. Spending extra to save later may not seem possible.

Does the Canadian Oil Substitution Program, COSP, Serve the Needs of Low Income Households?

The data available for analysis was from research which had the purpose of comparing households that used COSP with those that did not. As a result the study data did not directly address the important question raised above. The fundamental analysis needed is to determine whether or not among users of COSP, the proportion of low income is at least as high as the proportion of low income in the national population.

It was evident from the Statistics Canada Expenditures data that usage of oil for heating was uniformly distributed across income groups (approximately 40% of families had fuel oil expenditures). It was also evident from the Expenditures data that families paying for fuel oil were paying approximately 20% more than families paying for natural gas. This indicates that in addition to the national objective of switching from a more limited fuel, COSP can realize a special objective for the low income segment, namely helping to conserve their very limited family incomes.

The comparison of low income households that did versus did not convert from oil heating indicated the following:

- Very little difference in demographics

- Very little difference in house characteristics, although the house age for nonconverters appeared to be older.

- Very little differences in attitudes regarding the importance of energy conservation.

- Nonconverters were much more concerned about the cost of conversion. In particular, although they were almost fully aware of the availability of COSP and of the amount of the COSP grant, nonconverters felt that the level of grants was insufficient to enable their conversion.

Conclusions

The synthesis of this report is presented here in three sections, First, there are two themes that seemed consistently evident during the analysis of the various data sets. These are discussed under the headings, Energy Expense Poverty and Cash Flow Dominance. Second, consideration of the situation facing low income households leads to the recognition of particular energy problem areas, and accordingly, to the identification of energy program priorities aimed at aiding these families. Third, several short term research issues became obvious during the course of this study. These are listed in the final section.

CONSISTENT THEMES

Energy Expense Poverty. Both the Statistics Canada Expenditures data and the Energy Consumption and Conservation Survey indicate the problem low income

households have in reducing their energy spending to match their incomes. From Statistics Canada data, low income families spend 80% of what high income families spend on heat and light. Yet the total budget of the low income is only one third that of the high income. Even worse, low income unattached persons on one quarter the annual budget have heat and light expenses that are equal to their higher income counterparts. Using the ECCP data to segment homeowners showed that, while low income retired families were able to achieve somewhat lower heat and light spending, this expenditure for non-retired families did not decrease as incomes decreased.

In conclusion, all low income families are unable to keep their heat and light expenditures in line with their incomes. The most serious cases appear to be unattached persons and non-retired family homeowners. It seems clear that a careful reader of existing data must conclude that energy expense poverty is a major problem facing low income families in Canada.

Cash Flow Dominance. All three studies that focused on government conservation programs showed that low income households place more emphasis on the present cost than on potential savings in the future. From the Energuide research, low income households purchased energy efficient appliances only when they were also less expensive. From the CHIP research, low income households, while taking as many in home conservation actions, indicated their feeling that adding more insulation or other energy saving devices were not currently affordable. From the COSP research a major reason given by low income housenolds for not applying to COSP was that the grant and potential savings were insufficient to justify their furnace conversion.

The perspective seems very clear and not particularly surprising. When a household has to worry about the adequacy of their money in terms of covering

day to day needs, it is not surprising that future savings may be less important. In other words, current expenses take precedence over longer term considerations and results in cash flow dominance.

Future initiatives to assist low income households with energy expenses must be designed to account for the importance of cash flow dominance in their lifestyles.

ASSISTING THE LOW INCOME: ENERGY PROGRAM PRIORITIES

The priorities for initiatives to assist low income households can be considered from two views, priority energy forms and priority program types. The Statistics Canada data indicated households have much more diffculty matching heat and light expenses to income than they do with gasoline expenses. Thus in terms of energy type, it seems that programs dealing with in-home energy should take priority over programs concerned with automobile gasoline. It was noted in the ECCP data, that non-retired homeowners had as much difficulty with gasoline expenses as they did with heat and light. In other words for this segment of the low income gasoline is equally important. However, in general in-home energy should be the top priority.

Selection of priority conservation initiatives is facilitated by reviewing existing major government policies in light of the analysis presented in this report. The following summarizes four major policy areas -- prices, standards, subsidies, and information.

Conservation via a policy of rising prices. It is clear from the forgoing analysis, that this approach places a major hardship on low income households. From the perspective of the low income this is probably the worst possible conservation approach. The implication is that if rising prices are important

to overall national energy conservation, direct fuel subsidies for low income households should be considered.

Conservation via efficienty standards. It is evident from ownership data that low income households own fewer and older houses, appliances and automobiles. As result product standards, while effective in general, provide less benefit to the low income segment. Further, new product standards may have the short run effect of insuring that the second-hand market has a good supply of inefficient products and accordingly, an undesirable impact on the low income.

Conservation via retrofit subsidies. As was seen in the CHIP and COSP research, retrofit subsides appear to serve the needs of low income households, but may not go far enough. In particular the cash flow difficulties facing the low income appear to be a major deterent to retrofiting, even when a partial subsidy is available. Taking COSP as an example, it is highly desireable to assist low income households to switch from oil to gas. The Statistics Canada data indicated that fuel oil spending was typically 20% higher than natural gas. However, with a COSP grant of $800, the homeowner still has to spend $800 or more. Not surprisingly low income families may find this sum beyond their means. The implication is that retrofit subsidy programs must recognize the cash flow situation facing low income households, and be designed accordingly - for example full subsidies for the low income, or loans repayable from future savings.

Conservation via information programs. It appears from the earlier analysis that low income households are reasonably well informed regarding ways of conserving energy. Apparently conservation information programs have served the low income as well as other income segments. Information regarding appliance

efficiency, Energuide, appears less useful for the low income because of their less frequent purchase frequency and their cash flow constraints. The general implication appears to be that information programs may be useful, but should not be viewed as a primary means of assisting low income households.

In summary the analysis presented in this report indicates that the priority area for assisting low income households must be in-home energy, particularly heating costs. It appears that the conservation options needing priority consideration include energy subsidies and retrofit grants specially designed for low income families.

RESEARCH ISSUES

Three areas emerged as in need further research attention. First, both CHIP and COSP were reviewed without the benefit of complete program data. As a result some of the conclusions reached may be considered contentious by the managers of these programs. To the extent contentions arise, further analysis of program data would serve to amplify or modify the conclusions reached here.

Second, this research has served to point out how important renters are as a segment of the low income, and also how little information is available regarding the situation facing low income renters. This obviously represents a very critical direction for future research attention. An important starting point in this regard would be analysis of conservation actions by landlords of low income dwellings.

Finally, this report concludes that income dependant subsidies and grants appear to offer most promise in terms of helping low income households with their in-home energy expenses. Efforts of this type have been initiated elsewhere, in the U.K. and the U.S. Research into their successes and failures is an important first step in evaluating similar options for Canada.