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## **Time for Action: Background Paper**

This paper was produced for advance reading by delegates to the conference *Time for Action: Tackling energy poverty in Canada through energy efficiency*, 29 September to 1 October in Toronto, in order to help provide context to discussions, and provoke thought and ideas. Topics include energy burden statistics, impacts of high energy burden, energy efficiency as a means of reducing energy spending, and strategic questions about program design and delivery, and capacity-building.

This paper has been prepared by Clifford Maynes, Green Communities Canada, a national association of community organizations that deliver innovative, effective environmental programs (see [www.greencommunitiescanada.org](http://www.greencommunitiescanada.org)). Particular thanks to Steve Pomeroy of Focus Consulting for crunching the numbers. Thanks also to Blair Hamilton and Ken Tohinaka of Vermont Energy Investment Corporation (VEIC), whose broad knowledge and sharp intellects have advanced our own understanding of this topic. Address comments to : [cmaynes@greencommunitiescanada.org](mailto:cmaynes@greencommunitiescanada.org).

Thanks to sponsors of this paper, Newfoundland Housing Corporation, and Social Housing Services Corporation.

**Note: Table 4 has been removed from this revised version of the paper.**

## Energy burden

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**C**ANADIANS FEEL THE PAIN of rising costs of home heating and electricity, often accompanied by steep increases in the costs of water and sewer services. As the statistical appendix to this paper explores in greater detail, prices of water, fuel and electricity for home use increased about 50 per cent between 1997 and 2007, more than double the overall increase in the Consumer Price Index. And prices have continued to increase sharply since then - for example, a 25 per cent increase in natural gas prices between August 2007 and August 2008.

Thanks to a number of underlying fundamentals in energy supply and demand, energy prices will continue at high levels for the foreseeable future and probably continue rising. We have entered what the National Energy Board delicately terms “the new energy price paradigm.”

Water and sewer treatment and distribution costs are also climbing, in part because a history of under-investment in infrastructure is catching up with municipal systems.<sup>1</sup>

Everybody feels the pain, but low-income households can least afford to pay.<sup>2</sup> Given their limited means and other factors, they spend much less on utilities in *absolute terms*. But energy and water services are necessities, so low-income households are forced to spend a much larger proportional share of their available resources on energy and water.

*The average energy burden of the lowest-income quintile was 7.3 per cent - well over double the average for all Canadian households.*

Energy burden is the term we use to describe the percentage of income spent on home energy. Where possible, the calculation of energy burden should include the cost of water and wastewater, which forms an increasingly significant portion of the home utility bill.

***The energy burden of low-income households is much higher than average.*** The average household in the lowest income quintile spends 7.3 per cent of income on water, fuel, and electricity, compared to an average energy burden

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<sup>1</sup> See: Federation of Canadian Municipalities, *Danger Ahead: The coming collapse of Canada's municipal infrastructure*, 2007, which identified a \$31 Billion deficit in water and wastewater infrastructure.

<sup>2</sup> Note that energy burden refers only to home energy and not transportation use. High gasoline prices also hurt many lower income households, including rural residents who are vehicle-dependent.

for all Canadian households of 3.1 per cent. In other words, the energy burden of the lowest income quintile is well over double the average. In 2006, average household income in the first quintile was \$16,093, of which \$1,175 was spent on water, fuel, and electricity.

A comparison of the highest and lowest income quintiles is striking. The average energy burden of the highest income quintile was only 2 per cent, compared to 7.3 per cent for the lowest quintile, even though in terms of absolute spending the relationship was reversed: the average household in the highest quintile spent almost two and a half times more on energy and water.

For this paper, we looked at a time sequence from 1997 to 2006. The numbers show that Canadians have improved their average incomes - which means that (at least until 2006!) average energy burden has not increased despite significant price increases. Overall and in most income categories we spent about the same share of income on water, fuel, and electricity in 2006 as in 1997. The exception is the lowest income quintile, where average household energy burden grew from 6.7 to 7.3 per cent.

How much energy burden is too much? That's a question of social policy that has yet to be answered in this country. The U.K. government has defined 10 cent energy burden as the threshold for "fuel poverty" - what we in Canada would call "energy poverty." Alternatively, it has been proposed that Canada's energy poverty threshold should be double the average energy burden, which would be 6.2 per cent. Another suggestion: the threshold for utilities should be 6 per cent, which is 20 per cent of the threshold for shelter.

To gauge the incidence of high energy burden in this country, we looked at the number of households with energy burden exceeding 5 per cent and 10 per cent. Almost 3 million Canadian households (23.3 per cent) exceed the 5 per cent threshold; and close to a million households (7.6 per cent) exceed the 10 per cent threshold.

*Close to a million Canadian homes have an energy burden greater than 10 per cent.*

The stats yield an unexpected finding: for both thresholds, there were more owners than renters; further, a larger share of owners than renters experienced high energy burden.<sup>3</sup> However, energy burden for renters is likely understated in the statistics. That's because owners pay their utility bills directly and report them as such; however, renters often (we don't know *how* often) have heat and hydro included in rent, in which case utilities are reported as part of rent rather than separately.

<sup>3</sup> Renters comprised 64 per cent of households in the lowest income quintile, and 47 per cent of households in the second quintile. 2006.

In other words, rising energy costs are often buried in rising rents, rather than showing up as increased energy burden. The true incidence of high energy burden could actually be much higher than statistics indicate due to this limitation with the data.

## **Impacts of high energy burden**

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**H**IGH ENERGY BURDEN COSTS low-income Canadians, housing providers, and society as a whole. In Canada, these costs have not been systematically measured, but we know they are considerable - which by extension also means there are considerable benefits beyond the direct value of energy savings to the reduction of energy burden. In the U.S., one study based on an extensive literature review found that it is “reasonable and appropriate” to add 50 per cent to the value of direct energy benefits to account for the non-energy benefits of low-income energy efficiency programs.<sup>4</sup> Another study found that every dollar spent on low income energy efficiency generates \$1.88 in non-energy benefits.<sup>5</sup>

### *Costs borne by low-income Canadians*

As noted above, Canadian incomes - if not income equality - grew substantially in the last decade, a trend in which the average household in the lowest income quintile shared. At the same time, average price increases for rental housing moderated. In this context, energy/water cost increases have been a countervailing trend, undermining gains in well-being.

Rising utility costs bite into funds available for other household expenditures, including basics like food. Some impacts to low-income Canadian households:

- inability to pay energy bills, resulting loss of service, reconnect charges, denial of service
- consequent loss of shelter, resulting in moving costs and disruption, or even homelessness (inability to pay energy costs is regarded as the second leading economic cause of homelessness)
- reduced comfort (“freezing in the dark” to save money), compromised health and well being - deaths and other health impacts have been documented due to excessive cold or heat

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<sup>4</sup> John Howat and Jerrold Oppenheim, *Analysis of Low-Income Benefits in Determining Cost-Effectiveness of Energy Efficiency Programs, April 14, 1999.*

<sup>5</sup> Martin Schweitzer and Bruce Tonn, *Non-energy benefits from the Weatherization Assistance Program: A summary of findings from the recent literatures, Oak Ridge National Laboratory, April 2002.*

- hazards of supplementary heating - e.g., electric space heaters, deemed a major fire hazard in the U.S., although supporting data is lacking for this in Canada
- barriers to home ownership - Habitat for Humanity reports: "The increases have raised the minimum income level required for the families we are able to serve."

*"The impact of increased energy costs is simple: I lose my home of 20 years."  
co-op housing tenant, Kitchener*

Seniors are particularly hard hit, in part because they tend to have poorer circulation and are less able to withstand extreme temperatures. A gerontologist reports that seniors often huddle in bed to stay warm: "The resulting inactivity weakens muscle tone - placing them at risk of falls."<sup>6</sup>

#### *Housing provider impacts*

Where tenants pay their own heat and hydro, private and social housing providers may have increasing difficulty renting units. Tenant complaints increase. Utility shut-offs in winter due to non-payment of bills can lead to burst pipes, damaging one or more units. Landlords often cannot hope to recover these damages. (One social housing provider commented: "If the tenant didn't have the money to pay for heat, how are they going to pay for the damage?")

Where utilities are included in rent, social and private housing providers may pass cost increases along to tenants. As a result, rents may no longer be affordable for low-income tenants, which in the case of social housing defeats the purpose. For all housing providers, it can lead to increased tenant turnover, vacancies, and collections problems - all costly.

Finally, housing providers may absorb utility costs increases - by choice, or because they are forced to by rent control regulations or government funding formulae. For private landlords, this means squeezed profit margins. For all housing providers, there is less money to spend on maintenance - ultimately leading to a deterioration in the quality of the units, complaints, and downward pressure on rents. Energy costs tend to be volatile and unpredictable, adding to difficulty managing budgets.

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<sup>6</sup> Dr. Gloria Gutman, Director, Gerontology Research Centre, Simon Fraser University, May 2005.

To reduce their exposure, some private and social housing providers are transferring utility bills directly to tenants. In Ontario, for example, electricity sub-metering has become a hot topic because housing providers are concerned about bill increases due to the introduction of time-of-use pricing (“smart meters”).

*Other social impacts*

**Energy and environment.** The inefficient use of energy in low-income housing is a profound waste. Consider that the total annual utilities bill for the lowest income quintile is about \$3.1 Billion.<sup>7</sup> If we could cost effectively reduce that bill by 20 per cent through efficiency measures, we could save \$620 million annually.

Inefficient energy use in low-income households is also a serious barrier to Canada’s environmental goals, including reduction in greenhouse gases.<sup>8</sup> Low-income households must be included in any comprehensive strategy to improve the efficiency of Canada’s housing stock.

**Social assistance and health care.** High utilities costs are an increasingly significant barrier to poverty reduction. For governments at all levels, social spending that could otherwise help to improve the well being of less privileged Canadians is being used to heat leaky, poorly insulated housing with inefficient heating systems. Bill assistance programs - like the federal government’s \$1.3 Billion program in 2000 - absorb tax revenues that are therefore unavailable for other pressing social priorities. High energy costs increase pressure on community relief agencies and emergency shelters; and seniors may be forced to move out of their own homes into assisted housing.

Research in the U.S. and U.K. suggests a link between energy burden and health costs because of unhealthy temperatures (too hot, too cold), poor air quality, reduced spending on medical care (in the U.S.), and indirect impacts on diet.

**Local economy.** High energy bills drain scarce financial resources from low-income neighbourhoods - money that could otherwise circulate through the local economy, creating jobs and business opportunities, improving property values, and regenerating depressed areas.<sup>9</sup>

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<sup>7</sup> 2.65 million households x annual spending of \$1,175.

<sup>8</sup> CMHC reports that residential energy consumption accounts for 17 per cent of Canada’s secondary energy use; and 15.2 per cent of greenhouse gas emissions. Canadian Housing Observer, 2007. Energy efficiency programs need to reach the 20-40 per cent of Canadian homes where there are income-related barriers to retrofits.

<sup>9</sup> For this reason, neighbourhood-based retrofit programs, which sometimes include training of community members and job creation, are seen as contributing to neighbourhood revitalization and community economic development.

**Utilities.** High energy bills for low-income utility customers create costs for energy utilities and their ratepayers, including arrears, credit and collection costs, bad debt, termination and reconnection costs, and high bill complaints.

## **Tackling energy poverty through energy efficiency**

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**E**NERGY AND OTHER UTILITIES COSTS in Canada are expected to remain high and continue increasing, adding to energy poverty in this country. Efficiency by itself cannot neutralize energy poverty - other poverty reduction measures are required. However, efficiency can make a significant contribution to the reduction of energy burden, with significant environmental and other co-benefits.

*Canada's short-lived national program achieved average savings of 20 per cent - with identified potential savings of 39 per cent.*

How much can efficiency save? Although there hasn't been a systematic study of the energy efficiency potential in Canada's low-income housing, a target of 20 per cent savings does not seem unreasonable. We know that low-income households have a greater tendency to live in older dwellings - about three quarters of first quintile households live in dwellings constructed prior to 1980; and a third in dwellings constructed prior to 1946.<sup>10</sup> Older homes are more likely to be in need of repair. And a database of 200,000 energy audit ratings

published by Natural Resources Canada shows much higher energy consumption in older houses.<sup>11</sup>

Canada's short-lived EnerGuide for Low-Income Households (EGLIH) program reported actual measured savings in 231 completed retrofits of 20 per cent. However, potential savings of 39 per cent were identified in 960 energy audits, suggesting that even higher savings could be achieved. Actual measured savings under the EnerGuide for Houses Retrofit Incentive program (56,000 houses) were 27 per cent, again suggesting that even higher savings could likely be achieved in the low-income housing sector.<sup>12</sup>

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<sup>10</sup> CMHC, *Canadian Housing Observer*, 2006, p. 68. 2001 census data.

<sup>11</sup> e.g., average energy use per house: pre-1945 (297 GJ); 1970-79 (199 GJ); and 1990-97 (169 GJ). The good news is that older houses also have greater energy savings potential.

<sup>12</sup> Source: Natural Resources Canada.

## How do we do it?

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**R**ELATIVE TO THE U.S. AND OTHER jurisdictions, Canada has come late to the world of low-income energy efficiency. The U.S. has had a national program for more than three decades, with heavy participation from state governments and utilities.<sup>13</sup> The U.K. has a major national program with the goal of “eliminating fuel poverty” in a decade.<sup>14</sup> Yet, until recently, Canada has done relatively little - despite our cold climate and the demonstrated potential for savings - to improve the energy efficiency of low-income housing stock. We’ve had a world class program serving the able to pay market, but little to nothing for low-income households.

That appears to be changing. There have been two national conferences on the subject - *Affordable & Efficient* in Halifax in February 2005<sup>15</sup>, and now *Time for Action*. Canada actually did have its own national program, albeit short-lived, EnerGuide for Low-Income Households.<sup>16</sup> And many Canadian provinces, territories, utilities, and social housing providers now have their own programs, or are in the process of developing them. A newly formed committee under the Council of Energy Ministers is charged with recommending a national action plan for lower income household energy efficiency.<sup>17</sup>

The time is ripe for a national low-income energy efficiency partnership: not a single nation-wide program, but a *partnership* in which all levels of government, and all sectors - housing providers, social and environmental organizations, utilities and others - collaborate in making Canada a world leader rather than a laggard in achieving low-income energy efficiency.

*Time for Action* is intended to help create the foundations of this partnership, through information-sharing and abundant discussion about how best to reach

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<sup>13</sup> U.S. The Weatherization Assistance Program was established in 1976. More than 5.8 million homes have been weatherized - averaging a 31 per cent reduction in heating bills. U.S. Department of Energy funding in 2008 was \$227 million. With leveraged funds \$575 million was available. See:

<http://www.fas.org/programs/energy/btech/policy/Weatherization%20Article.pdf>.

<sup>14</sup> According to the 2007 annual report on the U.K. Fuel Poverty Strategy, “We are the first country in the world to recognise the issue of fuel poverty and to put in place measures to tackle the issue, including spending £20 billion on benefits and programmes since 2000.” See: [www.berr.gov.uk](http://www.berr.gov.uk).

<sup>15</sup> Presented by the Canadian Housing and Renewal Association in partnership with Green Communities Canada and the Affordable Housing Association of Nova Scotia.

<sup>16</sup> Prior to program cancellation, Parliament had committed \$500 million over five years to EGLIH.

<sup>17</sup> This is a subcommittee of the Demand Side Management Working Group, with representation from the provinces, territories, federal government, energy industry, and Canadian Renewable Energy Alliance. The plan will be presented to the Council of Energy Ministers in September 2009.

our shared goals. The remainder of this paper raises some potential topics for consideration at the conference. Admittedly, the discussion reveals the biases of the writer - apologies for that: the hope is to stimulate rather than pre-empt debate.

### *1. Goals and targets*

What are we trying to achieve?

The U.K. program set a ten-year target of eliminating fuel poverty, and some have suggested a similar target for Canada. This sort of goal speaks directly to the needs of low-income households. It is clear and compelling.

However, veterans of the U.K. scene warn that energy poverty is a factor of three variables: energy efficiency, energy prices, and income. Thus we could make substantial progress in improving energy efficiency, but if energy prices escalate rapidly, we fail.

For this reason it has been suggested that program goals should focus on energy efficiency, with minimizing energy burden as the primary goal, and increased energy efficiency and reduced greenhouse gas emissions as secondary goals.

Hard targets increase program accountability. A target should include:

- fixed time frame
- number of units retrofitted
- target group (e.g., least efficient low-income housing, vulnerable populations)
- efficiency outcome (e.g., retrofit to a set efficiency standard, or to levels that are cost effective based on avoided costs or participant savings)

### *2. Eligible and target households*

Some program providers want to limit eligibility to those most in need through extensive income pre-screening. However, complex income screening processes can be expensive and time-consuming to administer, and for the applicant they can be difficult to complete, embarrassing, or otherwise a barrier to participation.

An alternative is to cast the eligibility net widely, using existing social assistance programs such as the GST credit as a proxy for low-income. Then, to ensure the program reaches those most in need, outreach and recruitment can be used to target the poorest households in the least efficient housing - with priority to vulnerable populations (elderly, children, people with disabilities).

Another variation is to focus on low-income neighbourhoods – poverty by postal code – rather than the income eligibility of individual households. This makes a certain amount of sense because people move about, and move in and out of poverty: our objective is to upgrade low-income *housing*.

### 3. Program delivery strategies

The cheapest program design is simply to offer enhanced retrofit incentives to the owners of buildings with low-income occupants. Overhead is minimized. This was essentially the design of EnerGuide for Low Income Households (EGLIH): participants were required to apply, get an energy audit, find contractors and enter into agreements with them to complete approved retrofits, which were then paid for by government.

During its short life, EGLIH certainly attracted participants who were able to navigate their way through these requirements. However, critics point out that participant-managed programs tend to favour those with the greatest capacity, for example, retired seniors who are income-poor but asset-rich. To reach those who need it most, barriers to participation need to be systematically addressed with a bundled “turnkey” service in which audits and retrofits are managed on behalf of the participant. In some cases, a single agency may deliver the entire service, including the retrofit; in others, retrofits are performed by external contractors and merely managed by the agency.

Program delivery strategies need to be tailored to the needs of the participant. Barriers are experienced not only by owner-occupied households, but also often by private rental and social housing providers. Even within these categories there are major differences in support needs, for example, between large corporate landlords and small mom and pop landlords, or between social housing agencies with hundreds of units and a volunteer church group with a single building. Different building types also pose different barriers.<sup>18</sup> Shelters for the homeless and others occupy a wide variety of building types, including renovated industrial buildings. A primary aim of *Time for Action* is improved understanding of the unique barriers for each sector and sub-sector, and the need to address these practical obstacles with targeted, flexible program design. In general, that often means a customized bundled service rather than a do-it-yourself offering.<sup>19</sup>

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<sup>18</sup> In the lowest income quintile, 34.1 per cent of households occupied single detached dwellings, 49.5 per cent occupied apartment buildings, and 14.7 per cent occupied other multiple unit dwellings. In the second quintile 47.6 per cent of households occupied single detached dwellings, 35.7 per cent occupied apartment buildings, and 14.9 per cent occupied other multiple unit dwellings. Households in the top earning quintile overwhelmingly occupied single detached homes (77.8 per cent). 2001 Statistics Canada data, cited in CMHC *Canadian Housing Observer 2006*, p. 68.

<sup>19</sup> The money required to finance retrofits is a significant barrier. However, experience has shown that providing financing on favourable terms is not always sufficient to overcome a

In addition, mass marketing is unlikely to suffice as a way of reaching those who are hardest to reach and often need it most. Program participants in all sectors need to be engaged proactively through a network of community and sectoral organizations. The message, and the messenger, has to fit the target. For example, new Canadians need to be reached in their native tongue.

#### *4. Participant costs*

Participants in low-income energy efficiency programs benefit, whether they are occupants or housing providers. Should they contribute?

For low-income owner-occupants there is a strong argument against any charge: it is a barrier to participation, and therefore an obstacle to achieving program goals. For social housing, a similar argument applies.

For private rental housing, energy efficiency not only lowers energy cost to occupants but also provides a capital improvement to the property owner. The building is improved physically through measures such as new heating systems, and building quality may be improved, maintenance costs lowered, building life extended, and units made more marketable. Resale value may be improved.

American experience indicates that when retrofit programs are well established in local markets, private landlords are ready and willing to make a contribution toward retrofit costs. This requirement should not be set too high at the outset, until the value of retrofits has been established. Agreements need to ensure flow through of program benefits to tenants.

#### *5. Efficiency measures*

Some low-income energy efficiency programs address measures for only one energy source, e.g., the Ontario Power Authority's low-income programs to reduce electricity use. However, it is very difficult to market programs with this narrow focus, and a single-fuel program limits economies of scope and scale. Programs should address all fuel types.

There are also programs that address a single efficiency measure, e.g., only fridges or only heating systems. Again there are concerns about economies of scope and scale, and lost opportunities to capture savings from measures that aren't on the list. All measures need to be considered, including not only building retrofits, but also participant (occupant, owner, operator) behaviour.

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multitude of other barriers, including a lack of knowledge and expertise and the hassle factor of organizing retrofits.

The objective of low-income programs should be to capture all cost-effective savings. Since every building is different, a site-specific assessment is needed to ensure that measures are appropriate to the building. Ideally, every building should have a full-scale professional energy audit. But, particularly in large-scale programs it preferable where possible to use “smart protocols”: simplified and less expensive decision-making tools that identify cost-effective investments.

Another consideration: many low-income households require basic health and safety investments in conjunction with energy efficiency investments. Building envelope improvements are useless if windows are broken. Programs need to allow for cost-effective delivery of health and safety upgrades at the same time as energy-saving measures.

#### *6. Capacity development*

Delivering low income programs can require an extensive infrastructure, including outreach, recruitment, auditing, installation of measures, and program management. It may be necessary to invest in the development of this infrastructure, notably installation contractors with niche skills like air leakage control. Instead of relying on the market to generate the needed supply of contractors, skills development may be necessary, including cross-training in the interaction between measures (e.g., insulation installers need to protect the building envelope to avoid increased air leakage). Some programs address contractor skill requirements by training and employing retrofit crews directly, rather than relying on the market to provide them.

Finally, some broader considerations about capacity development.

In Canada, low income energy burden has never been systematically studied or tracked. Wouldn't it be helpful to know more about the true extent of the problem, and how it is evolving over time - not only nationally, but at the provincial and local level? Some major methodological problems could be addressed - like how to capture the impacts of utility price increases buried in rent.

Wouldn't it be good to have our own research about program cost-effectiveness in a Canadian context, energy and non-energy benefits of low-income retrofit programs, and the potential for linking low income retrofits with neighbourhood economic renewal, training, and job creation - i.e., “green pathways out of poverty”?

And wouldn't it be good to have mechanisms for ongoing information-sharing, cooperation, and capacity building among all sectors involved in low-income energy efficiency programs Canada-wide, including possibly future conferences

like *Time for Action*, workshops and webinars, a newsletter, internet-based resource sharing, and more?

Wouldn't it be good to have a ... *national low-income energy efficiency partnership*?

# STATISTICAL APPENDIX:

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This section provides greater statistical detail on energy burden and trends. Thanks to Steve Pomeroy of Focus Consulting for generating the tables reproduced at the end of the document.<sup>20</sup>

Quick summary:

- Water/energy prices have escalated rapidly over the past decade (1997-2007) - by more than 50 per cent. Price increases have been greatest for natural gas and heating oil.
- Prices have continued to grow in 2008 - and are expected to continue at high levels.
- On average, from 1997-2006, household spending on water/energy climbed steeply (35-40 per cent).
- Although poorer households spend much less than higher income households, lower income households experience greater energy burden, i.e., their water/energy spending accounts for a larger proportion of household income. Energy burden for the lowest income quintile (7.3 per cent) is well over double the average, and more than three and a half times the burden for the highest income quintile.
- Energy burden remained stable on average for most Canadians (1997-2006), because average incomes grew as fast as average energy/water spending. *However, energy burden for the lowest income quintile grew during that time, from 6.7 per cent to 7.3 per cent.*
- In 2006, almost a quarter of Canadian households (close to 3 million households) spent 5 per cent or more of their household income on

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<sup>20</sup> The data used in this brief was generated from Statistics Canada Survey of Household Spending (SHS) microdata file for the 2006 reference year. The data identifies the amount spent by households on certain subsets of energy. This does not present the price of energy, it is the expenses incurred and reflects both cost and varying levels of energy consumption across households and regions. It is important to note in using the SHS data file that this reflects spending patterns across a sample of households. Some do not report explicit energy costs because these expenses are included in their rents or condo fees. Accordingly the average expenditures tend to represent a lower estimate minimum expenditure.

home fuel and electricity. Close to a million Canadian households spent 10 per cent or more of household income for home energy.

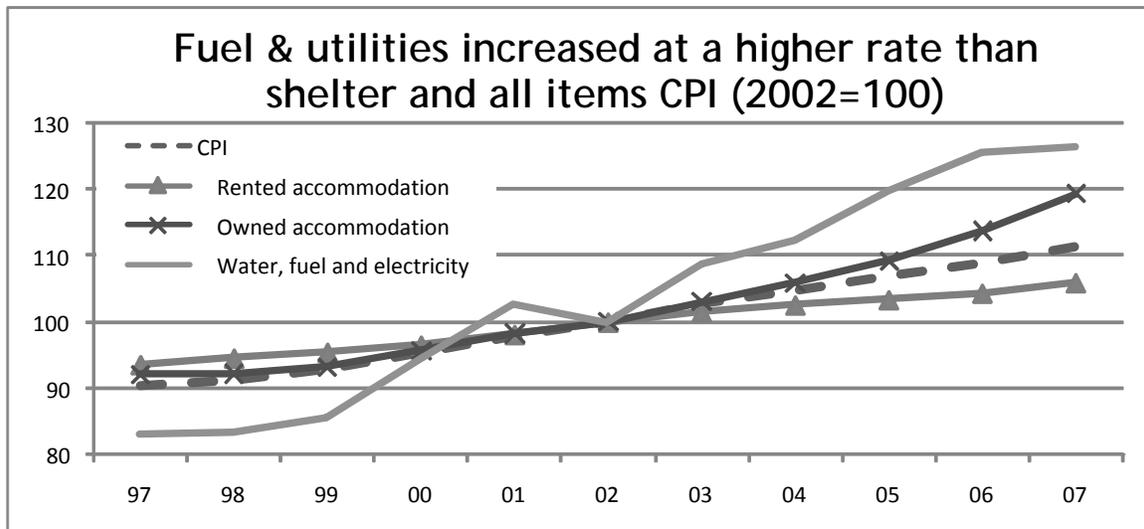
- Low income households are more likely to have electric space and water heating, and an older furnace.

## **Energy/water prices escalating rapidly (1997-2007)**

Prices of energy and other utilities for residential use have been escalating rapidly in Canada over the past decade. (Table 1)

Prices of water, fuel, and electricity Canada-wide increased 52.5 per cent between 1997 and 2007, during which time the Consumer Price Index (CPI) grew by only 23.3 per cent. *In other words, utilities inflation was more than double the overall rate of inflation.*

At the same time - 1997-2007 - overall shelter prices grew 28.7 per cent: 13.4 per cent for rented accommodation and 29.5 per cent for owned accommodation. This suggests that energy/water costs are becoming an increasing factor in shelter affordability. The good news on average for rents was countered by bad news for energy and utilities.



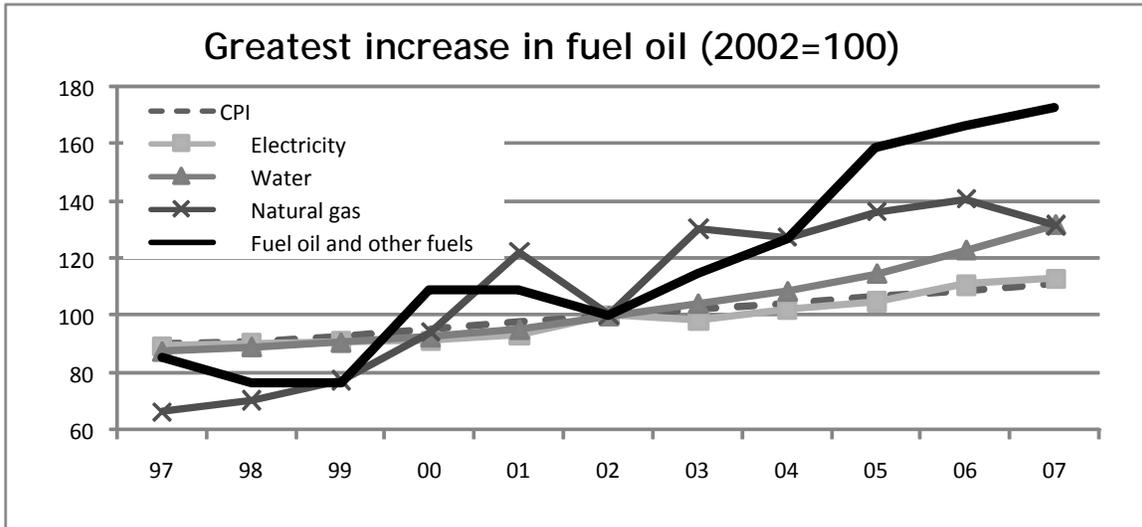
## **A closer look**

Water, fuel and electricity costs increased overall by 52.5 per cent, 1997-2007. Within that total:

- electricity increased 26.4 per cent, slightly above CPI

- water increased 50.6 per cent
- natural gas increased 97.4 per cent
- fuel oil and other fuels increased 102.5 per cent

Natural gas prices have been most volatile, although there has been a general upward trend.<sup>21</sup>



## Continued price growth in 2008 and beyond

The latest posted data for inflation (CPI) and price change point to continued high growth in prices. The price index for water, fuel, and electricity for July 2008 was 143 (2002 = 100), compared to 126.6 in December 2007.<sup>22</sup>

In August 2008, Statistics Canada reported very steep year-to-increase in natural gas prices of 25 per cent, in part a rebound from a decline in prices the year before, but also linked to oil price increases.<sup>23</sup> Natural Resources Canada reported average retail prices for furnace oil around \$1.20 a litre, compared to prices in the 80-90 cents a litre range in recent years.<sup>24</sup> At the end of August 2008, furnace oil prices were up 37.8 per cent year to year.<sup>25</sup>

<sup>21</sup> See also Natural Resources Canada, *Energy Use Data Handbook*, June 2008, pp. 42-43. From 1990 to 2004, natural gas prices increased 143.9%, heating oil prices increased 69.5 per cent, and electricity prices increased 41.9 per cent.

<sup>22</sup> Consumer Price Index, shelter, by province (monthly), July 2008.

<sup>23</sup> Statistics Canada: *Latest release from the Consumer Price Index*, Thursday, August 21, 2008.

<sup>24</sup> Accessed 14 September. *Fuel Focus*, Natural Resources Canada, Average Retail prices for Furnace Oil in Canada, [www.fueffocus.nrcan.gc.ca/prices\\_byyear\\_e.cfm?ProductID=7](http://www.fueffocus.nrcan.gc.ca/prices_byyear_e.cfm?ProductID=7).

<sup>25</sup> [www.fueffocus.nrcan.gc.ca/issues/2008-08-29/overview\\_e.cfm#recent](http://www.fueffocus.nrcan.gc.ca/issues/2008-08-29/overview_e.cfm#recent)

Further, sources such as the National Energy Board suggest that the underlying fundamentals of energy markets point to continued rising prices.<sup>26</sup> Factors include limitations on petroleum supplies (occasionally heightened by wars and extreme weather events); and soaring international demand for fossil fuels (China, India).

## **Prices by province**

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This paper focuses on the big picture, Canada-wide, but residents in some provinces have been harder hit in relative terms by energy/water cost increases than others.<sup>27</sup> For example, in July 2008, when the Canada-wide index for water, fuel and electricity was 143 (2002 = 100), the index was considerably higher for PEI (194.4) and Alberta (179.3); and lower for Manitoba (121.9), Saskatchewan (123.3), and Quebec (130.6). Ontario came in close to the national average, at 146.4. In other words, the CPI index for water, fuel and electricity increased 94.4 per cent in PEI between 2002 and July 2008, compared to a 43 per cent increase Canada-wide.

## **Utilities spending grows; poor spend less**

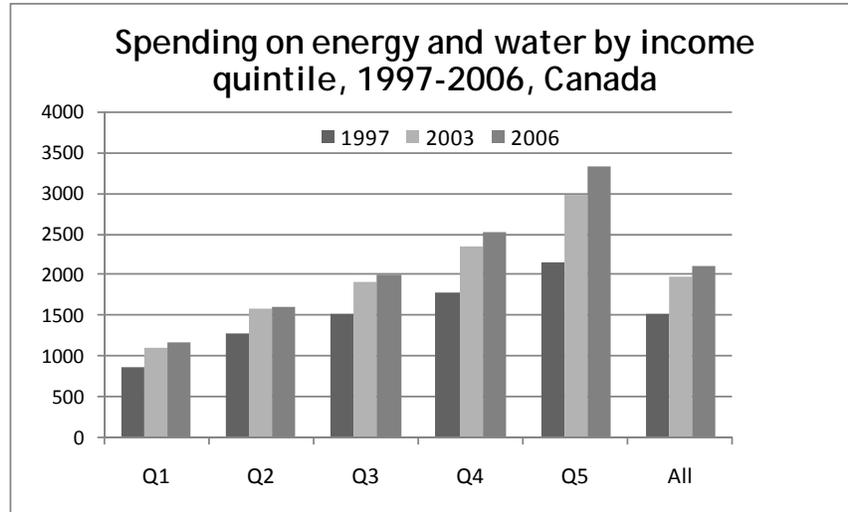
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Given price increases, it isn't surprising that actual household spending on energy/water has been growing (Table 2), though not as quickly. In 1997, the average Canadian home spent \$1,528; by 2006, this expenditure increased 39 per cent to \$2,119. Similar increases were experienced in all quintiles, as the chart below shows. For example, first quintile (lowest income) average spending on water fuel, and, electricity in 1997 was \$875; by 2006, it grew 34 per cent to \$1,175.

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<sup>26</sup> National Energy Board, *Canada's Energy Future – Reference case and Scenarios to 2030*. Chapter 7. " ... a return to sustained low commodity price levels is not foreseeable." NEB describes this as "the new energy price paradigm." See: [www.neb.on.gc.ca](http://www.neb.on.gc.ca).

<sup>27</sup> Statistics Canada, Consumer Price Index, shelter, by province (monthly), July 2008. See: [www40.statcan.ca/101/cst01/cpis09a.htm](http://www40.statcan.ca/101/cst01/cpis09a.htm).



It is also important to note that that the data (Table 2) show lower income households spend *much less* than average on water, fuel, and electricity, a relationship that has continued over time. For example, in 1997, the highest income quintile cent of households spent nearly two and a half times more on energy/water than the lowest income quintile; in 2006, the top quintile spent closer to three times more on energy/water than the bottom quintile.

It would appear that people with reduced income are relatively frugal<sup>28</sup> – although the difference in reported spending may be exaggerated due to the higher penetration of rental accommodation in the lower quintiles where heat and hydro are often included in the price of rent, and therefore do not appear independently in the data.<sup>29</sup> There is also a higher incidence of single person and smaller households in the lower income quintiles with less space to heat and consuming less water, etc.

## Energy burden high for low-income households

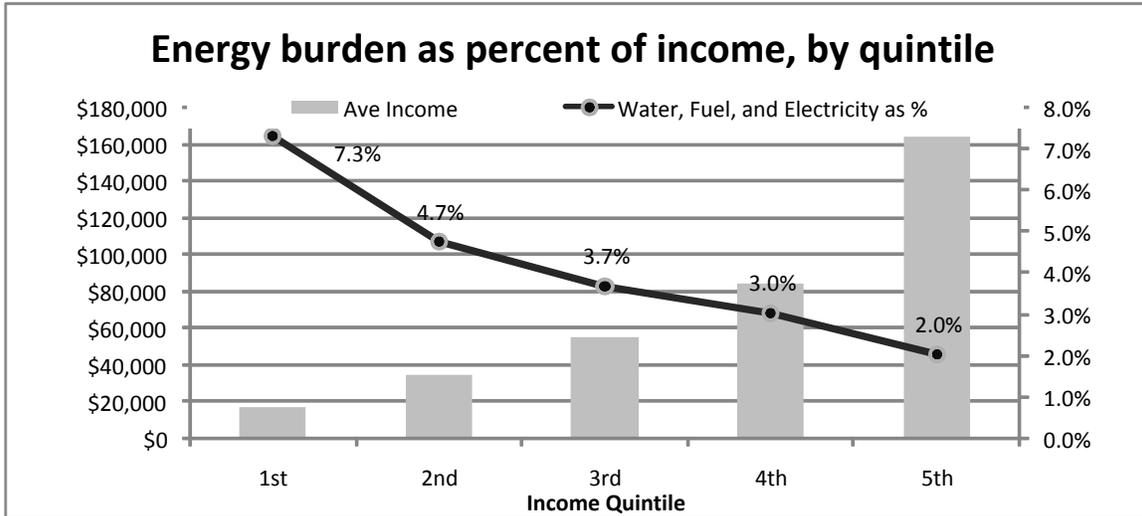
*Although lower income households spend less in absolute terms on water, fuel, and electricity, they spend considerably more in relative terms as a share of their income. Energy/water spending as a proportion of household income is called energy burden. (Table 2a)*

The chart below tells the story. Canadian households are divided into five income quintiles, each with a fifth of the households in the country. Average

<sup>28</sup> For a related discussion, see *Size Matters, Canada's Ecological Footprint, By Income*, a study by the Canadian Centre for Policy Alternatives (CCPA). The study found that the richest 10 percent of Canadians create an ecological footprint that is 66 percent higher than the average Canadian household. See: <http://www.growinggap.ca/node/113>.

<sup>29</sup> This issue - poor reporting of energy in rental accommodation - is a general methodological and data problem for the study of energy burden.

household income for all households was \$68,938; for the lowest quintile it was \$16,093; and for the highest quintile, it was \$163,203.



The line charts household spending on residential water, fuel, and electricity as a percentage of income. For all of Canada, the average was 3.1 per cent. For the lowest income quintile, energy burden was 7.3 per cent. For the highest quintile it was 2 per cent.

*Thus, the energy burden of the poorest quintile was well over double the average, and more than three and a half times the burden for the richest quintile.*

The high energy burden of low-income households reflects the fact that water, fuel, and electricity are basic necessities - as income drops, households may try to cut back consumption, but they can only cut so far, hence they are forced to spend a greater share of their limited income on energy/water.

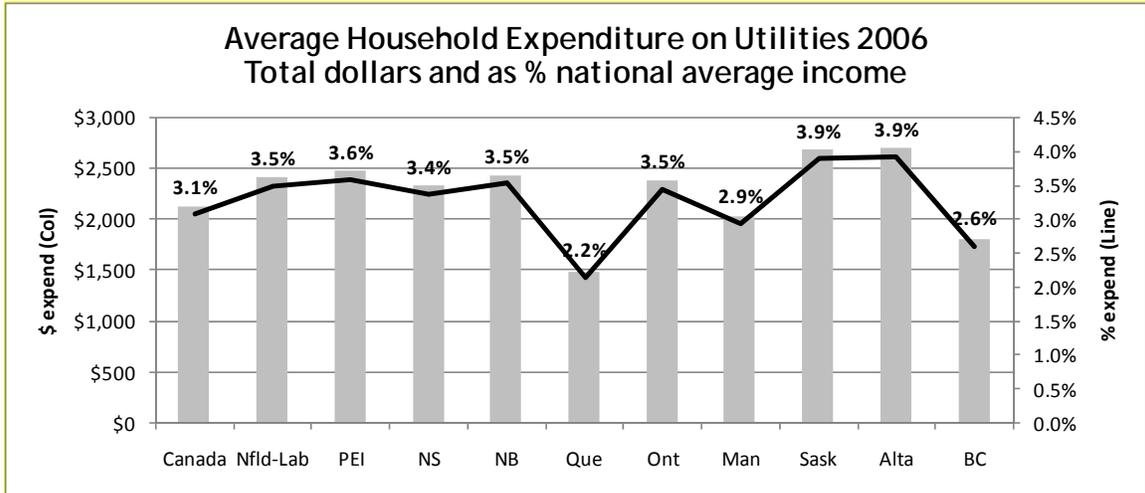
It is worth noting again a bias in the data: because a larger share of lower incomes households rent, and because heat and hydro in older properties are often included in rent (i.e., paid indirectly rather than directly), actual spending on water, fuel, and electricity may be higher than reported.<sup>30</sup>

## Energy spending, burden varies by province

The figures above are for Canada as a whole. There is some variation across the country, which reflects older housing stock with differing levels of energy

<sup>30</sup> This is true too for ownership condominiums where some utilities, notably A/C, is included in condo fees, rather than separately paid.

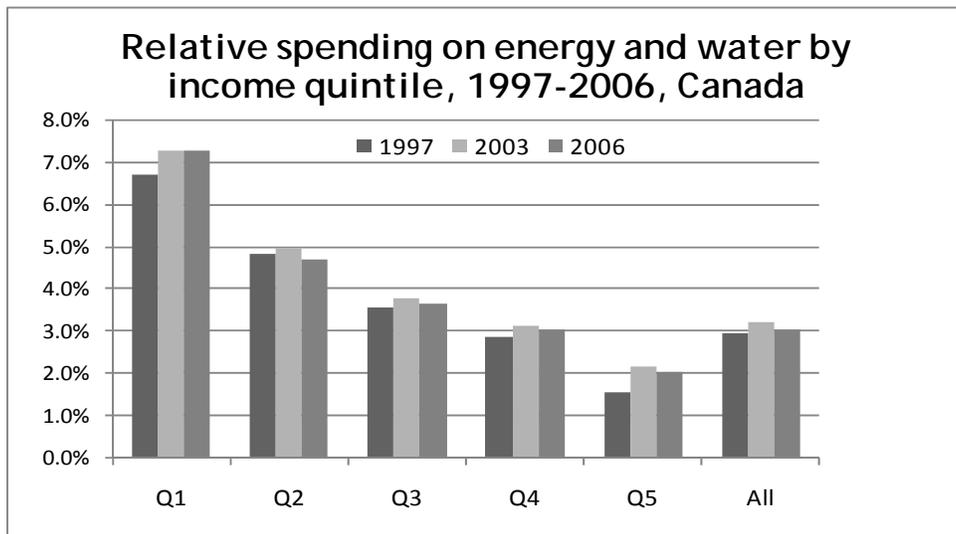
efficiency and types of heating systems, which all influence energy consumption.



Residents in many provinces pay more than the national average which is pulled down by relatively lower expenditures in Quebec (heating fuels very low) and B.C., two provinces rich in hydro electric generation. The older less efficient homes are likely a factor in the Atlantic, while the high costs in the Prairies (except Manitoba) may reflect some combination of larger homes and colder winters.

### Energy burden for lowest income group is growing

It is interesting to look what is happening to energy burden over time. (Table 2) As the chart below shows, energy burden overall and in most quintiles has been relatively stable despite significant price increases - this is because average income has grown as rapidly as average energy/water spending.



However, in the lowest quintile, energy burden increased from 6.7 in 1997 to 7.3 per cent in 2006.

Again, energy burden for the lower quintiles would likely be greater if indirect energy/water costs (buried in rent) were included. Further, it is likely that energy burden may have been exacerbated by continuing high energy/water price increases since the 2006 census.

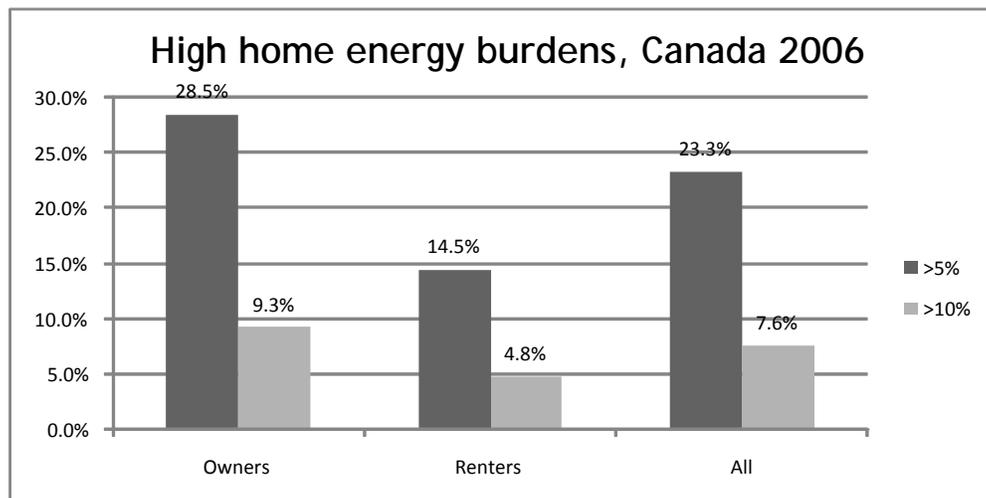
## Incidence of high energy burden

How many Canadian households experience high energy burden?<sup>31</sup>

Of the total 12.76 million households in Canada in 2006, almost 3 million (23.3 per cent) spent 5 per cent or more of household income on home fuel and electricity. (Table 3)

Close to a million households (7.6 per cent) spent 10 per cent or more of household income.

Somewhat surprisingly, there are many more owners than renters exceeding  $\geq 5\%$  burden (2,294,700 vs. 622,300) and  $\geq 10\%$  energy burden (744,800 vs. 205,700). In part this is because owners make up two thirds of the population. This also reflects a high incidence of high home energy burdens among low income elderly owners.



<sup>31</sup> No formal definition of high energy burden or “energy poverty” is proposed here. However, since the average burden for all households is 3.1 per cent, a burden 5 per cent or more is cause for concern, and ten per cent or more - over three times the average - is surely excessive.

The relative incidence of high energy burden is also higher among owners:

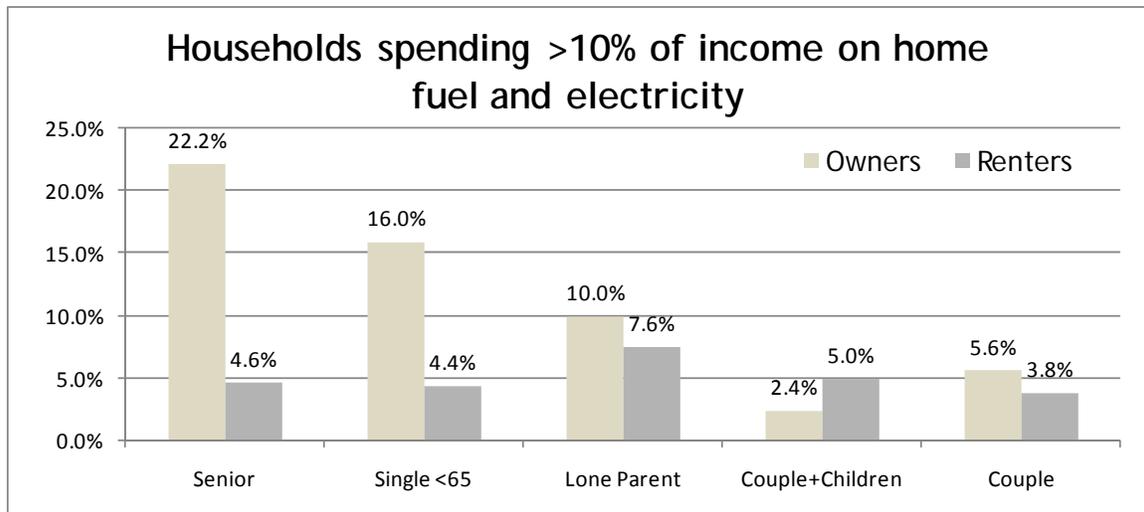
- Energy burden exceeding 5 per cent affects 28.5 per cent of owner-occupied households, compared to 14.5 per cent of rental households.
- Energy burden exceeding 10 per cent affects 9.3 per cent of owner occupied homes, compared to 4.8 per cent of rental homes.

The preponderance of owners over renters may also be partly explained by expenditure patterns of energy/water in rental accommodation where these are included in rent, but nevertheless are being passed on to households as part of their shelter costs. Owners are much more likely to have distinct separate bills.

If we knew the actual total cost of energy and water being paid indirectly as well as directly by low-income households, the numbers experiencing burdens exceeding 5 or 10 per cent would likely be much higher.

With this caveat, Table 3 and the chart below give an indication of the relative breakdown by household type. For example,

- of senior led households, 43 per cent have an energy burden exceeding 5 per cent; 16.6 per cent have an energy burden exceeding 10 per cent
- of lone parent family households, the incidence of high burden is 29.2 per cent ( $\geq 5\%$ ) and 8.7 per cent ( $\geq 10\%$ )



## **Low income tied to higher cost energy**

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First quintile households are much more likely than average (47 vs. 35 per cent) to have heating equipment that is over 20 years old (Table 5). Although favourably close to the average in having equipment that is five years old or newer (20.5 vs. 23.7 per cent), first quintile households also lag in the 6-10 year old category (9.9 vs. 14.5 per cent) and 11-15 year old category (8.6 vs. 16.1 per cent). Overall, the data suggest low income households are less likely to have modern mid- to high-efficiency heating systems.

Low income households are also more likely to have electric heating, which in some jurisdictions (notably Ontario) means higher costs. The principal heating equipment is electric in 42.3 per cent of first quintile households, vs. an average of 30.1 per cent. The principal heating fuel is electricity in 46.6 per cent of first quintile households, vs. an average of 34.7 per cent.

Similarly, water heating is more likely to be electric (56.4 vs. 46.1 per cent) and less likely to be natural gas (37 vs. 48.3 per cent).

## Table 1 Consumer Price Index for shelter

Table 326-0021 - Consumer price index (CPI), 2005 basket, annual (2002=100)(1,2,3,4,5,6,7,8,9)

Survey or program details:

Consumer Price Index - 2301

	97	98	99	00	01	02	03	04	05	06	07	
CPI	90.4	91.3	92.9	95.4	97.8	100	102.8	104.7	107	109.1	111.5	23%
Shelter	90.8	91.1	92.3	95.6	99.1	100	103.2	105.8	109.2	113.1	116.9	29%
Rented accommodation	93.5	94.5	95.4	96.5	98.1	100	101.5	102.6	103.4	104.4	106	13%
Owned accommodation	92.1	92.2	93.2	95.6	98.3	100	103	105.9	109.2	113.7	119.3	30%
Water, fuel and electricity	83	83.3	85.5	94.4	102.7	100	108.9	112.5	119.8	125.9	126.6	53%
Electricity	89.3	90.1	90.8	91.3	92.9	100	98	102	104.9	110.8	112.9	26%
Water	87.6	89.2	90.7	92.6	95.2	100	104.3	108.6	114.8	123	131.9	51%
Natural gas	66.5	70.6	77.5	94.2	122.1	100	130.1	127.4	136.3	140.5	131.3	97%
Fuel oil and other fuels	85.2	76.5	76.8	108.7	108.8	100	114.9	126.5	158.7	165.9	172.5	102%

Source:

Statistics Canada. Table 326-0021 - Consumer price index (CPI), 2005 basket, annual (2002=100 unless otherwise noted) (table), CANSIM (database), .  
[http://cansim2.statcan.ca/cgi-win/cnsmcgi.exe?Lang=E&CANSIMFile=CII\CII\\_1\\_E.htm&RootDir=CII/](http://cansim2.statcan.ca/cgi-win/cnsmcgi.exe?Lang=E&CANSIMFile=CII\CII_1_E.htm&RootDir=CII/)  
 (accessed: September 2, 2008)

<b>Converted to 1997 base</b>	97	98	99	00	01	02	03	04	05	06	07
Commodities and commodity groups (1997=100)											
All-items(16)	100	101.0	102.8	105.5	108.2	110.6	113.7	115.8	118.4	120.7	123.3
Shelter(18)	100	100.3	101.7	105.3	109.1	110.1	113.7	116.5	120.3	124.6	128.7
Rented accommodation	100	101.1	102.0	103.2	104.9	107.0	108.6	109.7	110.6	111.7	113.4
Owned accommodation	100	100.1	101.2	103.8	106.7	108.6	111.8	115.0	118.6	123.5	129.5
Water, fuel and electricity	100	100.4	103.0	113.7	123.7	120.5	131.2	135.5	144.3	151.7	152.5
Electricity(20)	100	100.9	101.7	102.2	104.0	112.0	109.7	114.2	117.5	124.1	126.4
Water	100	101.8	103.5	105.7	108.7	114.2	119.1	124.0	131.1	140.4	150.6
Natural gas	100	106.2	116.5	141.7	183.6	150.4	195.6	191.6	205.0	211.3	197.4
Fuel oil and other fuels	100	89.8	90.1	127.6	127.7	117.4	134.9	148.5	186.3	194.7	202.5

**Table 2: Average Household Expenditure on Energy and Utilities, By Income Quintile**

1997	Average Expenditure					
	Q1	Q2	Q3	Q4	Q5	All
Ave Income	13000	26632	42516	62348	136691	51133
Total - Water, Fuel, Electricity	875	1288	1524	1790	2163	1528
Water and sewage (3)	70	118	157	203	280	166
Fuel (e.g., oil, gas)	253	371	423	522	662	446
Electricity (3)	552	799	944	1064	1221	916
2003 Ave Income	15,199	31,908	50,274	74,837	136,691	61,782
Total - Water, Fuel, Electricity	1,110	1,596	1,918	2,354	2,989	1,994
Water and sewage (3)	91	146	197	254	356	209
Fuel (e.g., oil, gas)	375	567	673	887	1,140	728
Electricity (3)	644	884	1,048	1,213	1,493	1,056
2006 Ave Income	\$16,093	\$34,073	\$54,713	\$83,563	\$163,203	\$68,938
Total - Water, Fuel, Electricity	\$1,175	\$1,614	\$2,017	\$2,539	\$3,335	\$2,119
Water and Sewage	\$88	\$152	\$206	\$281	\$392	\$221
Fuel (e.g., oil, gas)	\$396	\$545	\$710	\$942	\$1,375	\$785
Electricity	\$691	\$918	\$1,101	\$1,316	\$1,568	\$1,113

(3) Respondents sometimes report household electricity payments together with their water and sewage payments. This affects estimates of average household expenditure and percentage reporting for "Electricity" and "Water and sewage". The summary category "Water, fuel and electricity" is unaffected.

**Table 2a: Average Household Expenditure on Energy and Utilities, By Income Quintile**

	As percentage of pretax income					
	Q1	Q2	Q3	Q4	Q5	All
<b>1997 Total - Water, Fuel, Electricity</b>	6.7%	4.8%	3.6%	2.9%	1.6%	3.0%
Water and sewage (3)	0.5%	0.4%	0.4%	0.3%	0.2%	0.3%
Fuel (e.g., oil, gas)	1.9%	1.4%	1.0%	0.8%	0.5%	0.9%
Electricity (3)	4.2%	3.0%	2.2%	1.7%	0.9%	1.8%
<b>2003 Total - Water, Fuel, Electricity</b>	7.3%	5.0%	3.8%	3.1%	2.2%	3.2%
Water and sewage (3)	0.6%	0.5%	0.4%	0.3%	0.3%	0.3%
Fuel (e.g., oil, gas)	2.5%	1.8%	1.3%	1.2%	0.8%	1.2%
Electricity (3)	4.2%	2.8%	2.1%	1.6%	1.1%	1.7%
<b>2006 Total - Water, Fuel, Electricity</b>	7.3%	4.7%	3.7%	3.0%	2.0%	3.1%
Water and Sewage	0.5%	0.4%	0.4%	0.3%	0.2%	0.3%
Fuel (e.g., oil, gas)	2.5%	1.6%	1.3%	1.1%	0.8%	1.1%
Electricity	4.3%	2.7%	2.0%	1.6%	1.0%	1.6%

**Table 3 Spending burdens - home fuel & electricity, by tenure, household type\***

	Household Type	Total counts			As Percentage of HH	
		Total	>=5%	>=10%	>=5%	>=10%
<b>Owners</b>	Senior	1,725,600	941,100	383,100	54.5%	22.2%
	NonElderlySingle	852,400	332,200	136,200	39.0%	16.0%
	LoneParent	323,900	129,400	32,300	40.0%	10.0%
	CoupWithChildren	2,761,800	397,700	65,800	14.4%	2.4%
	Couple	1,608,100	353,000	90,500	22.0%	5.6%
	Other	776,100	141,500	36,800	18.2%	4.7%
	<b>Total - Owners</b>	<b>8,048,000</b>	<b>2,294,700</b>	<b>744,800</b>	<b>28.5%</b>	<b>9.3%</b>
<b>Renters</b>	Senior	778,500	138,000	36,200	17.7%	4.6%
	NonElderlySingle	1,442,100	180,100	64,100	12.5%	4.4%
	LoneParent	356,000	70,700	26,900	19.9%	7.6%
	CoupWithChildren	542,300	76,500	27,000	14.1%	5.0%
	Couple	577,600	57,200	22,100	9.9%	3.8%
	Other	589,200	99,700	29,400	16.9%	5.0%
	<b>Total - Renters</b>	<b>4,285,600</b>	<b>622,300</b>	<b>205,700</b>	<b>14.5%</b>	<b>4.8%</b>
<b>Total</b>	Senior	2,528,700	1,087,900	419,400	43.0%	16.6%
	NonElderlySingle	2,391,700	529,700	206,500	22.1%	8.6%
	LoneParent	699,600	204,100	60,800	29.2%	8.7%
	CoupWithChildren	3,417,200	482,800	93,600	14.1%	2.7%
	Couple	2,295,900	423,700	120,300	18.5%	5.2%
	Other	1,422,600	248,200	66,800	17.4%	4.7%
	<b>Grand Total</b>	<b>12,755,600</b>	<b>2,976,200</b>	<b>967,400</b>	<b>23.3%</b>	<b>7.6%</b>

NA indicates income is zero or less

Total includes households who changed tenure during year. Total exceed sum of owners plus renters due to mixed tenure households.

\* Note, this is a minimum estimate, energy may not be explicitly reported, some are hidden in rent or condo fee expenses

Source: Adapted from Statistics Canada, Survey of Household Spending PUMF, 2006. Cat. No. 62M0004XCB

**Table 5 dwelling and equipment characteristics by income quintile and tenure, Canada 2006**

SHS 2006

Principal Heating Equipment	Total (1)					
	1st	2nd	3rd	4th	5th	Total
Steam or Hot Water Furnace	17.1%	15.0%	12.2%	9.9%	9.4%	12.8%
Forced Air Furnace	36.3%	44.9%	51.0%	60.5%	72.3%	52.7%
Heating Stoves	4.2%	4.9%	5.3%	4.8%	2.6%	4.4%
Electric Heating	42.3%	35.1%	31.5%	24.9%	15.7%	30.1%
<b>Age Of Heating Equipmen</b>						
5 years or less	20.5%	20.2%	25.1%	24.9%	27.9%	23.7%
6-10 years	9.9%	13.4%	14.1%	16.6%	18.9%	14.5%
11-15 years	8.6%	11.0%	13.3%	14.9%	16.1%	12.7%
16-20 years	14.0%	13.6%	15.0%	13.1%	14.8%	14.1%
Over 20 years	47.0%	41.9%	32.4%	30.5%	22.3%	35.0%
<b>By Principal Heating Fuel</b>						
Oil or Other Liquid Fuel	11.1%	10.3%	9.5%	8.9%	7.7%	9.5%
Piped Gas	36.0%	42.2%	47.2%	54.3%	67.9%	49.2%
Electricity	46.6%	40.1%	35.7%	29.8%	20.3%	34.7%
Bottled Gas, Wood, or Other	6.2%	7.4%	7.6%	7.0%	4.1%	6.5%
<b>By Principal Heating Fuel for Hot Water</b>						
Oil or Other Liquid Fuel	5.0%	4.6%	4.1%	3.9%	3.7%	4.3%
Piped Gas	37.0%	41.2%	46.1%	52.8%	65.6%	48.3%
Electricity	56.4%	53.3%	48.4%	41.9%	29.4%	46.1%
Bottled Gas, Other, or No Running Hot Water	1.7%	0.9%	1.4%	1.4%	1.3%	1.3%

Note: (1) Total includes households who changed tenure during year. Total exceed sum of owners plus renters due to mixed tenure households.

Source: Adapted from Statistics Canada, Survey of Household Spending PUMF, 2006. Cat. No. 62M0004XCB

Principal Heating Equipment	Owners					
	1st	2nd	3rd	4th	5th	Total
Steam or Hot Water Furnace	9.5%	9.0%	8.2%	7.0%	8.1%	8.1%
Forced Air Furnace	55.9%	59.2%	58.7%	64.3%	74.3%	64.0%
Heating Stoves	9.2%	7.5%	6.4%	5.4%	2.6%	5.6%
Electric Heating	25.4%	24.3%	26.6%	23.3%	15.0%	22.2%
<b>Age Of Heating Equipmen</b>						
5 years or less	17.9%	19.9%	25.7%	25.2%	27.4%	24.2%
6-10 years	17.0%	17.4%	16.9%	18.3%	19.2%	18.0%
11-15 years	12.4%	14.2%	14.5%	16.2%	16.7%	15.3%
16-20 years	12.6%	13.7%	15.3%	13.3%	15.4%	14.3%
Over 20 years	40.2%	34.7%	27.7%	26.9%	21.2%	28.3%
<b>By Principal Heating Fuel</b>						
Oil or Other Liquid Fuel	15.6%	11.3%	10.1%	9.0%	7.9%	10.0%
Piped Gas	43.9%	47.6%	49.7%	54.9%	69.1%	55.2%
Electricity	28.5%	28.5%	31.1%	28.6%	19.1%	26.6%
Bottled Gas, Wood, or Other	12.0%	12.6%	9.1%	7.5%	3.9%	8.2%
<b>By Principal Heating Fuel for Hot Water</b>						
Oil or Other Liquid Fuel	5.1%	3.9%	4.2%	4.0%	3.8%	4.1%
Piped Gas	39.5%	43.2%	47.1%	53.0%	66.6%	52.3%
Electricity	54.0%	51.5%	47.6%	41.8%	28.4%	42.3%
Bottled Gas, Other, or No Running Hot Water	1.3%	1.3%	1.0%	1.3%	1.2%	1.2%

Renters

**Principal Heating Equipment**

	1st	2nd	3rd	4th	5th	Total
Steam or Hot Water Furnace	21.4%	21.8%	22.0%	23.8%	25.1%	22.0%
Forced Air Furnace	25.6%	29.2%	34.1%	42.6%	48.3%	31.0%
Heating Stoves	1.5%	2.0%	3.1%	2.1%	0.9%	1.9%
Electric Heating	51.5%	47.0%	40.9%	31.5%	25.8%	45.1%

**Age Of Heating Equipmen**

5 years or less	21.5%	19.9%	22.9%	19.9%	22.9%	21.2%
6-10 years	6.1%	8.9%	8.6%	7.7%	15.4%	7.9%
11-15 years	6.6%	7.4%	10.4%	9.0%	13.8%	8.1%
16-20 years	14.6%	13.6%	14.4%	14.6%	9.9%	14.1%
Over 20 years	51.2%	50.1%	43.7%	48.9%	38.0%	48.7%

**By Principal Heating Fuel**

Oil or Other Liquid Fuel	8.9%	9.6%	8.7%	8.6%	7.3%	9.0%
Piped Gas	31.4%	35.6%	42.2%	50.8%	52.8%	37.5%
Electricity	56.6%	52.7%	44.6%	35.6%	35.5%	50.2%
Bottled Gas, Wood, or Other	3.1%	2.1%	4.5%	5.0%	4.4%	3.3%

**By Principal Heating Fuel for Hot Water**

Oil or Other Liquid Fuel	4.9%	5.3%	4.1%	3.6%	3.3%	4.7%
Piped Gas	35.1%	38.2%	43.8%	52.2%	53.8%	40.2%
Electricity	58.0%	56.0%	49.7%	42.6%	40.7%	53.6%
Bottled Gas, Other, or No Running Hot Water	1.9%	0.5%	2.5%	1.5%	2.2%	1.6%