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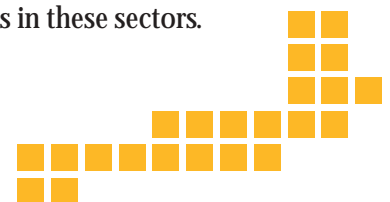
NEWS

Welcome to the first issue of *enerInfo Building* the newsletter of the new Canadian Building Energy End-Use Data and Analysis Centre (CBEEDAC). The Centre was established in March of this year, in cooperation with both the Department of Economics and the School of Business at the University of Alberta, and is one of four Data and Analysis Centres funded by Natural Resources Canada (NRCAN) under NRCAN's National Energy Use Database (NEUD) initiative. CBEEDAC is responsible for improving knowledge and accessibility of building energy data for the Canadian residential, commercial, and institutional sectors.

The core objectives of the Centre include:

- 1) the identification and cataloguing of relevant sources of energy end-use data and literature, and the assessment of gaps in that information;
- 2) the establishment, maintenance, and dissemination of relevant databases;
- 3) economic, statistical and technical analysis of energy end-use and energy-use technologies; and
- 4) the development of a centre of expertise that will serve as a point of contact for sponsors and interested parties, and that will focus on the advancement of the training of business and economics graduate students in the area of residential, commercial and institutional energy end-use analysis.

Working with data providers and users from all levels of government, the residential and commercial sector, and the research community, the Centre supports a forum on strategic data collection and analysis, and facilitates an integrated approach to energy-efficiency improvements in these sectors.





INTRODUCING CBEEDAC

CBEEDAC is an organization currently comprised of members from the Department of Economics and from the School of Business at the University of Alberta. The research expertise and interests of the directors and research associates, combined with the existing graduate studies programs, make the Centre well suited to enabling a multi-disciplinary approach to data management and to analysis and improvement of knowledge in the building sector.

Director, **David Ryan**, is a Professor in the Department of Economics. He works predominantly on econometric specification and estimation, particularly of demand and cost systems. The focus of much of his work pertains to energy use and deals with demand patterns in the residential and commercial sectors. His most recent work has included a number of publications in international journals concerning the imposition of curvature restrictions in demand systems that maintain the flexibility of the functional specification, and the development of new specifications of these systems.

Associate Director, **André Plourde**, is the EPCOR Professor of Energy Policy and an Associate Professor in the School of Business at the University of Alberta. His research has focussed on energy economics and Canadian energy policy issues and part of his related research activities has involved assembling and managing large amounts of data on energy use and prices, and on the characteristics of energy use. Much of his published work has appeared in international journals and deals with energy demand modeling and analysis, impact assessment of changes in energy markets and policies, and electricity deregulation in Alberta.

Research Associate, **Melville McMillan**, is a Professor in the Department of Economics. His research and publications are concentrated in the area of public sector economics and, in particular,

on local public finance, fiscal federalism, and on the demand for publicly provided goods and services.

Research Associate, **Denise Young**, is an Associate Professor in the Department of Economics. Her areas of specialization are applied econometrics and the economics of natural resources, and her publications include journal articles on issues in copper markets, and the effects of pollution on agricultural productivity.

Research Associate, **Heather Eckert**, is an Assistant Professor in the Department of Economics and her research and teaching interests are in the areas of environmental economics, natural resource economics, and law and economics.

Executive Director, **Donna White**, is a masters graduate of the University of Alberta in the field of applied biology. Her twenty-year career experience includes research and management in the areas of applied biology and agriculture.

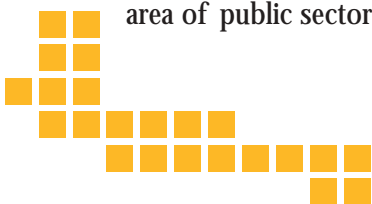
Graduate Research Assistants are currently being recruited to work on projects relevant to the Centre's core objectives. One of the Centre's primary goals is the advancement of training of business and economics graduate students in the area of

residential, commercial and institutional energy end-use analysis.

CBEEDAC is also establishing an **Advisory Board** to assist in identifying priorities for future work and to function in the review process of the Centre's activities. The Board will include, but will not be limited to, representation from interested stakeholders, such as retail energy providers; environmental groups; provincial and municipal governments; and Natural Resources Canada.

This newsletter, published in March, July, and November, will highlight and summarize CBEEDAC's current and completed projects and feature articles on topics relevant to energy end-use analysis in the building sector.

One of the Centre's primary goals is to advance the training of business and economics graduate students in the area of residential, commercial, and institutional energy end-use analysis.



CHANGES IN ENERGY DEMAND PRICE RESPONSIVENESS – ASYMMETRY OR ATTENUATION?

by David Ryan and André Plourde

One of the puzzling features of energy – and especially oil – demand in the last few decades concerns apparent changes in its responsiveness to energy prices. This situation is illustrated in the accompanying figures for the residential sector, although similar patterns are also found in the commercial sector. As shown in Figure 1, the real price of oil to final users in Canada increased during the 1970s and the first part of the 1980s, peaking in 1985. During this time, residential demand for oil products (Figure 2) decreased rather steadily, as conventional demand theory would suggest. However, the situation since 1985 has been noticeably different. While the price of oil in real terms has never returned to its 1985 level, and has in fact generally decreased since then, demand for oil in the residential sector has not only never recovered, but has continued to decline.

These observations, in Canada and elsewhere, have led to questions about whether oil demand has simply become less price responsive since the mid-1980s, or whether the observed behaviour is due to the fact that prices have been declining, and that energy demand responses would be similar to those of the early 1980s if real oil prices were to increase again. In an era where consideration is being given to the use of economic instruments to reduce greenhouse gas emissions, this issue is one of more than mere academic interest. If energy demand has become less price responsive, it would suggest that if economic instruments are to be used, they would need to cause a very large increase in energy prices in order to elicit the desired response in energy use. As can be imagined,

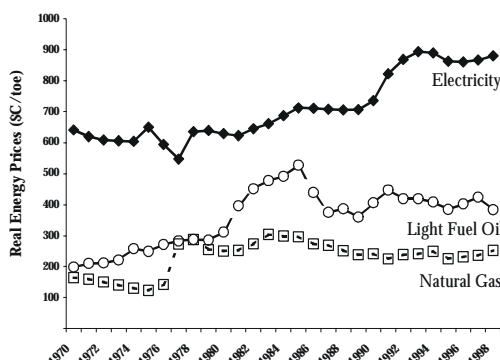
price increases of these magnitudes are likely to have profound adverse effects on economic activity. An alternative view is that energy demand responses are asymmetric – they differ

according to whether prices increase or decrease. In the case of buildings, the logic for this view is relatively straightforward. As energy prices increase, substitution is made between energy and other inputs, such as capital. For example, newer models that are more efficient and that utilize a different fuel may replace oil-burning furnaces. Similarly, buildings may be retrofitted, adding insulation, etc., to reduce energy requirements. Governments may also respond to the higher prices by introducing policies aimed at enhancing energy efficiency. In such cases, should prices subsequently decline, as they have, it would not be expected that newer furnaces would be discarded, or that insulation would be removed, or that policies encouraging increased energy efficiency would be reversed. Hence, although energy price responsiveness appears to be reduced, this is viewed as being a consequence of the fact that prices have been falling reasonably steadily over the last 15 years. Should energy prices return to the high levels experienced previously, larger energy demand responses would be expected, as once again reductions in energy use become more attractive to consumers.

A number of studies have examined this issue from different perspectives. A brief summary of the relevant methodology and findings is contained in a recent paper by Ryan and Plourde,¹ who investigate the price responsiveness of non-transport oil demand in five OECD countries (Canada, France, Japan, U.K., U.S.). Based on an extended model that allows

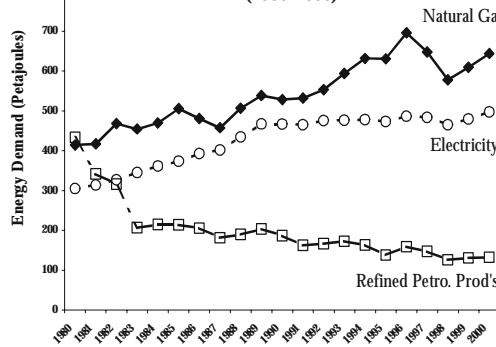
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Fig. 1: Real Energy Prices for Residential Electricity, Light Fuel Oil, and Natural Gas in Canada (1970-1998)

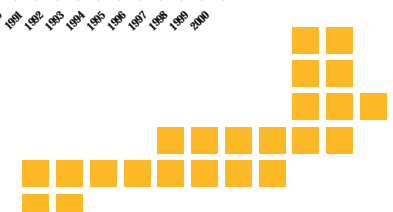


Source: International Energy Agency

Fig. 2: Energy Demand for Natural Gas, Electricity, and Refined Petroleum Products in the Canadian Residential Sector (1980-2000)



Source: Statistics Canada, CANSIM



Changes in Energy Demand (cont'd)

asymmetry as well as non-constant elasticities, their results suggest that both effects can be detected in the data: energy demand responses do appear to differ for price increases and decreases, and the oil demand elasticity appears to have fallen in absolute value over time. The policy implications of these results are not yet clear, as more work is needed to confirm the relative importance of these two effects and to ascertain whether the results can be generalized to a broader context.

1 "Smaller and smaller? The price responsiveness of non-transport oil demand", *The Quarterly Review of Economics and Finance*, 42, 2002.

GRADUATE RESEARCH

CBEEDAC acknowledges with gratitude, the University of Alberta's Department of Economics and School of Business and our sponsors' contributions to graduate education. In cooperation with CBEEDAC, the Economics Masters program, the MBA with specialization in Natural Resources and Energy, and the jointly offered Economics and Finance masters degree program will extend new employment and training opportunities to their graduate students.

In our first year, CBEEDAC will provide two graduate students the opportunity to further their training and complete graduate projects in the area of residential, commercial, and institutional energy end-use analysis under the supervision of the directors and research associates at the Centre. Investing in the development of intellectual capital is essential to the advancement of the understanding of energy end-use and efficiency in the building sector and is one of the core objectives of the Centre.

CBEEDAC would like to thank Christina Zschocke (Honours Economics) and Isabelle Michaud (MBA program) for their research assistance in the establishment phase of the Centre.

BITS & BYTES

SECTOR ENERGY USE

The residential sector accounted for 17 % of secondary energy use in Canada and 15.5 % of related GHG emissions in 1999. In the same year, the commercial and institutional sectors of the economy accounted for 12.5% of secondary energy use and 12.0% of the related GHG emissions. (*The State of Energy Efficiency in Canada*, Office of Energy Efficiency, NRCan, 2001)

OFFICE EQUIPMENT

Having a computer monitor that falls asleep is a good thing! Monitors equipped with power management features power-down to 15 watts or less when not in use, consume up to 90% less energy, and emit less heat. Check out <http://yosemite1.epa.gov/Estar/consumers.nsf/content/monitor.htm> for more information on sleeping savings.

APPLIANCES

Refrigerators consume an estimated 11% of a home's total energy requirements. New models consume up to 50% less than those marketed 25 years ago. However, many people invest in a new model only to move their old unit into the basement-therby foregoing hundreds of dollars in energy efficiency savings per year. If you really need that extra refrigeration space, check NRCan's *EnerGuide Appliance Directory-2002* for smaller replacement models that will translate into long-term savings for you and the environment.

PARTNERS' CORNER

Improving energy efficiency in buildings depends, to a great extent, on how well we communicate the issues and work together to seek solutions. As we work towards building a valued resource for this sector, we need to hear your issues and development ideas.

If your organization is interested in partnering with the Centre we need to talk about how we can best achieve our shared objectives.

If you find the *enerInfo Building* newsletter informative, please tell your colleagues and direct them to our website or office where they can download or request a copy. If you want to stop receiving this newsletter or have received it in error, please contact us. We respect the privacy of those on our mailing list.

