An Evaluation of Energy Efficiency and its Applicability to Low Income, Inner City Groups in West Broadway, Winnipeg, Manitoba

By
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A Thesis
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In Partial Fulfillment of the Requirements
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ABSTRACT

Half of the properties in West Broadway are rental properties. West Broadway's socio-economic demographics such as high unemployment, low incomes, and higher crime rates have resulted in the City of Winnipeg's designation of "Major Improvement Area." West Broadway's local development corporation is helping revitalize housing and the neighbourhood. To date, energy efficiency has been underutilized in retrofits by low income groups and local community groups due to factors including retrofit costs, lack of targeted information, and barriers to program access.

While programs and policies targeting improving energy efficiency in the residential sector exist, these programs and policies have not focused on low income groups or low income housing providers. For low income groups, improving energy efficiency is important in light of potentially rising heating bills (high energy costs) and the inability of the lower income community to afford to pay these increasingly higher energy (heating) bills.

This combination of low income groups and rising energy costs presented an opportunity for examining how low income groups access energy efficiency programming. This project examined program availability across Canada, other country's energy policies and potential models that could be incorporated into the City of Winnipeg's zoning and taxation laws and sustainability goals. As well, low income groups provided feedback about improving Manitoba Hydro's existing programming.

This project recommended that a variety of stakeholders assume responsibility for improving energy efficiency for low income groups. Housing providers must incorporate energy efficiency in housing they provide, the City of Winnipeg must develop ordinances such as Residential Energy Conservation Ordinances, and programmers such as Manitoba Hydro must develop accessible programming designed for low income groups. Ongoing energy efficiency education is recommended for all stakeholders. The upfront costs of completing energy upgrades be lowered for low income groups. Mechanisms to lower the

upfront cost of upgrades include interest rates, energy mortgages, and community modeled savings programs. More needs to be done to connect people who most need to lower their heating bills—but cannot afford to—to programs they can afford, access, understand, and use.

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GLOSSARY OF TERMS

Acceptable housing: Housing that is adequate in condition, suitable in size, and affordable. Adequate dwelling units are those reported by their occupants as not requiring major repairs. Suitable dwelling units have enough bedrooms for the size and make-up of resident households, according to National Occupancy Standard requirements. Affordable dwelling units cost less than 30% of before-tax household income (Engeland, Lewis, 2004).

Affordable housing: Housing that costs less than 30% of a household's pre-tax annual income (Engeland, Lewis, 2004).

Core need of housing: When households live in housing that is below one or more of the adequacy, suitability, or affordability standards, and have incomes that are too low to allow them to rent alternative local market dwellings that meet acceptable standards for less than 30% of their before-tax income, they are considered to be in core housing need. By definition, these households are excluded from acceptable housing and from the benefits such housing confers (Engeland, Lewis, 2004).

Downtown: The downtown is defined by specific boundaries including the Red River to the east, the Assiniboine River to the south, the Legislative Building, Central Park, Exchange District, and Chinatown to the west, and the CPR main-line at Higgins to the north (City of Winnipeg, 2001).

Housing Improvement Zones (HIZs): Neighborhoods classified and categorized based upon established criteria as "Housing Improvement Zones" will be targeted through the use of various incentive "tools" in order to stimulate housing investment. Neighbourhoods are designated into one of four categories based upon established criteria:

- Major Improvement Areas: Older areas that have experienced significant decline to the point where housing and neighbourhood infrastructure require complete renewal.
- Rehabilitation Areas: Areas where decline is having a spill-over effect to the extent that it is beginning to impact the overall stability of the neighbourhood. Some intervention would be required in order to stimulate private reinvestment and improve infrastructure.

- Conservation Areas: Neighbourhoods which are physically and socially stable but are showing initial signs of decline. The City will monitor these areas for any potentially detrimental intrusions and may intervene in isolated cases.
- Emerging Areas: Areas in which new development is being considered. The City's role will be to ensure appropriate coordination of land use and infrastructure. (City of Winnipeg, 2001).

Inner City: The Inner City is bounded by:
West -- Augrey / Ingersol / McPhillips
North -- Church / Red River
East -- Red River / Archibald
South -- Marion / Red River / Corydon / Cockburn / Assiniboine River
The Inner City area was first defined in the 1980s by the Core Area Initiative, a tri-partite government agreement to combat decline in the inner city. The official Downtown area is included in the Inner City. (City of Winnipeg, 2001).

Low Income Cut-Off: A family at or below the LICO is one that spends more than 55% of its pre-tax income on food, clothing, and shelter (Statistics Canada, 2003). Note: The LICO rate is subject to change based on yearly calculations completed by Statistics Canada.
The LICO varies by family size and community size. (Social Planning Council, 2004).

Mtoe: Million tonnes of Oil Equivalent (International Energy Agency, 1996).

Neighbourhoods: Neighbourhoods were defined following the amalgamation of the City of Winnipeg in the early 1970s, and were intended to serve as the basic building blocks of the city for planning purposes. The entire city is made up of neighbourhoods, designated residential, industrial or rural. The neighbourhoods were defined based on their characteristic features and natural boundaries, so that once identified the neighbourhood boundaries would not be subject to arbitrary change. Some neighbourhood areas were added or modified in response to new developments in parts of the city, but for the most part neighbourhood boundaries have remained the same. There are 230 neighbourhoods in the City of Winnipeg at present. (City of Winnipeg, 2001)

Non-Inner City: The Non-Inner City is not officially defined by the City of Winnipeg. Members of the Community Data Network defined Inner City and Non-Inner City to allow

comparisons of older and newer areas of Winnipeg. The Non-Inner City includes all of the neighbourhoods that are not part of the Inner City (City of Winnipeg, 2001).

CHAPTER 1

INTRODUCTION

1.0 Background

People spend 90 percent of their time indoors: at their homes, places of employment, and other locations, therefore it is important that the home is healthy. Research indicates that there is a relationship between the built environment and human health (Consumer Product Safety Commission, et al., 2003). Housing choices for low income groups are limited in scope. Neighbourhoods they can afford to live in, questions of ownership vs. tenancy, housing quality and affordability are all factors merging to create a situation where the housing quality that many low income individuals and families find themselves living in is less a *designed choice* and more of a *forced compromise.* As part of the housing compromise faced by low income groups is their energy use. Housing found in many of Winnipeg's inner city neighbourhoods was built before 1920 and lacks the adequate insulation necessary to keep the houses warm without using a lot of heat. For low income groups, high heating bills can be devastating to their budgets and force them to take funds from other life necessities such as food. But can those low income earners who get an expensive heating bill take measures to improve their energy efficiency and thereby lower their heating bills?

Unfortunately, those who would benefit most from retrofits to their homes and other energy-saving measures are in the worst position, both socially and economically, to take advantage of available programming. Low-income households often lack the capital or access to credit to pay for retrofits or audits to determine energy savings. These households may not be able to wait for the payback from reduced energy costs or have enough information about energy efficiency. As most do not own their accommodation, they have little incentive to invest in capital improvements for energy efficiency.

Through a comprehensive study focusing on examining Manitoba Hydro's family of PowerSmart Programming, access and use of this programming will be examined in the context of low income families living in West Broadway, Winnipeg, Manitoba. Based on pervasive pre-existing conditions such as larger energy inefficient housing that require

more energy for heating as well as social considerations such as low income levels, and a high rent to own ratio, the West Broadway area of Winnipeg provides an excellent forum to explore the above issues.

The relationship between low income housing, energy use, and current available energy efficiency programming will be examined in several ways in order to capture a holistic picture. Existing data sets, such as Statistics Canada's census data, the City of Winnipeg's property tax assessment information, and information gathered through home evaluations and ecological footprints will be used to develop a neighborhood level understanding of low income housing and energy efficiency. The combination of a large number of older homes in West Broadway, the lack of healthy affordable housing, the amount of housing requiring repairs and upgrades, and the need to improve inner city neighborhoods are all relevant factors for considering in a study on energy efficiency and low income groups within inner city neighbourhoods. West Broadway's current situation certainly challenges the World Health Organization's (WHO) definition of health, unchanged since 1948, which states "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO 1948)", and as such requires a response that incorporates social, cultural, community, ecological, and physical dimensions. Energy efficient housing for low income groups would be an important aspect of social health.

In keeping with the WHO definition, I undertook the following activities to develop an understanding of the use of energy efficiency programming, barriers, and existing inducements within West Broadway to improve energy efficiency:

1. Evaluated and made recommendations on Manitoba Hydro's Energy Efficiency Programming, including home evaluations via the on-line and mail-in assessment services, and observed EnerGuide for Houses In-Home Assessments as available in the West Broadway area.

2. Undertook a literature review on available energy reduction incentive programs across Canada and energy reduction models for low income groups in Denmark and the United States of America.

3. Developed a focus group for community group housing advisors and community members around Manitoba Hydro's PowerSmart programming.

With each of these activities, there is overlap between the information that was gathered and generated in terms of energy efficiency and socio-economic concerns, but this overlap, or linkage, grounded the research and provided different perspectives on the same activity.

1.1 Opportunity Statement

Improving energy efficiency within houses is important. Current programming that provides incentives for improving energy efficiency may not be reaching lower income or inner city neighbourhoods due to structure and/or residential constraints such as program awareness, home owner's ability to complete the program, or housing characteristics which do not qualify for the programming. Therefore, the opportunity to examine the PowerSmart programming in the context of lower income, inner city neighbourhoods is valuable for developing future programming and improving existing programming. As well, the Power Smart family of programming is Manitoba Hydro's largest group of residential energy efficiency incentive based programming. As the sole provider of energy in Manitoba, Manitoba Hydro has a responsibility to encourage responsible energy use in all sectors they service.

1.1.1 Study Rationale

The construction and renovation of housing requires large amounts of resources, is labour intensive, impacts human health, and can also present a financial burden for people with limited finances. This study investigated and identified mechanisms affecting current acceptance and use of energy conservation programs within low income housing groups. The following objectives provided insight into the issues of low income groups and their access to energy efficiency programming.

The objective of Power Smart Programming is to improve energy efficiency in residential, industrial, and commercial buildings. This study's research objectives were to determine whether the PowerSmart Residential Programming at Manitoba Hydro was satisfactorily meeting the needs of low income, inner city neighbourhoods, and the organizations that provide housing in those areas.

1.1.2 Objectives

In order to meet the goals of this research, the following objectives were conducted:

1. Determine current use of existing Manitoba Hydro programs and low income access to the programming in Winnipeg.
2. Evaluate the performance and scope of Manitoba Hydro's energy efficiency programs in comparison to other available provincial utility energy efficiency programming for low income earners.
3. Promote and make recommendations about the adoption of those mechanisms that encourage energy efficiency in housing for low income groups.

In order to meet the above objectives, the following activities were undertaken:

1. Attended twelve in-house evaluations in West Broadway or in neighbourhoods with similar characteristics and interviewed the evaluators that conducted the evaluations.
2. Examined current programs sponsored by Manitoba Hydro, specifically the Home Comfort & Energy Savings Assessment Guide (client checklist), and the EnerGuide for Houses In-Home Energy Evaluation (home energy audit) to make recommendations compared to best practices/programming in other provinces and countries.
3. Convened a focus group for community group representatives and residents focused on examining Manitoba Hydro's current PowerSmart programming.

Research underscores the importance of having good quality housing, particularly for children and women. A study done by Evans (2000) consistently found that housing

quality can affect mental health, in that better-quality housing was related to lower levels of psychological distress. The research suggests that significantly better housing quality is linked to improvements in psychological well-being. Such evidence is important and can be used to encourage legislators and policy-makers to promote housing improvements for low and moderate-income families (Evans, 2000). Part of promoting better quality housing for low income groups is addressing energy efficiency.

For already vulnerable populations such as the elderly, fixed income groups, single parent families, and First Nations — all of whom live within the West Broadway area—the socio-economic costs of having poor quality housing is reflected in their utility bills and high heating bills. In response to the quantity of poor quality housing and the lack of affordable housing ownership options, several community groups, including churches and service organizations, have begun to rehabilitate the existing housing stock (Santin, 1998) available in Winnipeg's inner city neighbourhoods.

For low income groups who cannot afford to pay higher heating bills, including energy efficiency in the rehabilitation process is critical, but often neglected due to a variety of factors and challenges that will be examined throughout this thesis—affordability of completing energy efficiency upgrades, awareness of programs to assist with energy efficiency retrofits, language skills to understand information about energy efficiency upgrades, and ability to complete the renovations.

1.1.3 LICO and Affordable Housing Definitions:

For the purposes of this research, Statistics Canada's Low Income Cut Off (LICO) definition has been used. While Canada has no official measure of poverty, the pre-tax Statistics Canada Low Income Cut Off (LICO) is the measure most commonly used by those reporting on poverty in Canada. Statistics Canada has noted that the LICO is a consistent way of identifying those who are "substantially worse off than average". In addition, Canada Mortgage and Housing Corporation's definition of affordable housing is being used. Affordable housing being housing that costs less than 30% of a household's annual income. Based on both LICO and the definition of affordable housing, the

community in West Broadway can be considered to be a lower income neighbourhood with higher housing costs.

1.1.4 Project Context: Global Energy Perspectives and Local Power Supply Concerns

World wide, the scarcity and preciousness of renewable and nonrenewable resources is indicated by rising oil and gas prices, water concerns, public policies, and public outcry from dispossessed groups. In light of the serious local and global impact of all resource and energy consumption, local determination of resource and energy use patterns in the housing industry is vital if Manitobans are going to lower their resource and energy consumption, and encourage healthy home construction. Energy consumption is expected to grow; estimates indicate that, "Between 1998 and 2020, world primary energy demand is expected to grow by 57% from 8,610 Mtoe to 13,539 Mtoe" (del Rosario, 2002).

In 2003, The World Meteorological Organization (WMO) issued a generalized warning about an emerging climate change pattern. "Global average land and sea surface temperatures in 2003 were the second highest since records began in 1880," (WMO, 2003 in CNN, 2003). The WMO indicated that for the northern hemisphere, increasing temperatures, longer, more severe droughts, and other extreme weather events seemed to be conceivable based on its data (WMO, 2003 in CNN, 2003).

> New analysis of data for the northern hemisphere showed the increase in temperature in the 20th century was likely to have been the largest in any century during the past 1,000 years. (Cornford, 2003, CNN, 2003)

Chaotic weather events were not limited to the northern hemisphere, but also occurred around the world with many countries and continents experiencing record breaking heat waves, precipitation, flooding, tornadoes, etc. The following extreme weather events occurred in 2003 around the world.

562 tornadoes hit the United States in May, 2003—a record far higher than the previous monthly peak of 399 in June, 1992