State of Knowledge on Market Tools for Sustainable Communities

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ABSTRACT

The purpose of this report is to identify examples of 'best practices' for Environmental Pricing Reform (EPR) strategies in Canadian municipalities. That is, examples of where EPR strategies have been implemented and have effectively achieved some environmental goal. The ultimate goal in identifying these 'best practices' is to identify any key factors that have led to their success or any other lessons for other jurisdictions currently considering some form of EPR strategy.

The examples discussed in this report include:

- Transit-oriented development in Mont Saint Hilaire, Quebec;
- Development cost charges in Kelowna, British Columbia;
- Density bonuses in Ucluelet, British Columbia;
- Brownfield remediation in Hamilton, Ontario;
- Fuel taxes in Montreal, Quebec, Vancouver, British Columbia and Victoria, British Columbia;
- Parking Sales Tax in Vancouver, British Columbia;
- Bikelinx in Toronto, Ontario;
- Car-sharing in Montreal, Quebec and Vancouver, British Columbia;
- Volumetric pricing for water in Vernon, British Columbia;
- Subsidies for water-efficient retrofits in Barrie, Ontario;
- Pay-as-you-throw waste charges in Victoria, British Columbia and Owen Sound, Ontario;
- Subsidies for energy-efficient retrofits in Peterborough, Ontario;
- Incentives for 'green' roofs in Toronto, Ontario.

The rationale for implementing each is discussed, as well as the results of implementation (where possible) and an attempt is made to identify lessons or any useful conclusions for future applications.

The main findings for this report are as follows:

- Despite the number of effective EPR strategies that have been identified, EPR strategies remain, for the most part, underutilized in Canadian municipalities;
- Where EPR strategies are in place, greater effort should be made to monitor, analyze and report the results so that other Canadian municipalities may benefit from the experience, whether it is positive or negative.

Currently, information on municipalities' experiences with EPR strategies is difficult to locate. Addressing these two issues would improve the state of knowledge of EPR strategies as they have been employed by municipalities in Canada.

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LIST OF ABBREVIATIONS

AMRC	Association of Municipal Recycling Coordinators
AMT	l'Agence Métropolitaine de Transport (Montreal's metropolitan transportation agency)
CRD	Capital Regional District of British Columbia (Victoria)
CMHC	Canadian Mortgage and Housing Corporation
CWWA	Canadian Water and Wastewater Association
DCC	Development Cost Charges
DSM	Demand Side Management
EPR	Environmental Pricing Reform
FCM	Federation of Canadian Municipalities
LEED	Leadership in Energy and Environmental Design
MBI	Market Based Instrument
NGO	Non-Governmental Organization
OCP	Official Community Plan
PAYT	Pay-As-You-Throw municipal waste programs
TIF	Tax-Increment Financing
TOD	Transit Oriented Development
TOU	Time-Of-Use pricing structure for electricity consumption

1: INTRODUCTION

Environmental Pricing Reform (EPR) is not a new topic. Governments have been using market-based instruments (MBI), user charges, subsidies, taxes and other fees for decades to create incentives and influence behaviour in support of environmental objectives. However, recent years have seen EPR grow in popularity, especially as a tool for municipalities to diversify their revenue streams. EPR strategies can be used to address a number of environmental concerns and municipalities have a wide range of financial levers at their disposal. For certain issues such as water conservation, the use of financial incentives is widespread in Canadian municipalities. For other issues, EPR strategies are currently underutilized. The purpose of this report is to identify examples of EPR strategies that are currently being used effectively (or have been used effectively) in Canadian municipalities. These will be referred to as 'best practices' in this report.

The potential for EPR strategies to address environmental concerns while generating income for cash-strapped municipalities is well documented[1]. The goal now is to identify successful examples and identify keys to success so that they may be applied in other municipalities across the country. It should be noted that the powers of municipal governments to implement EPR strategies vary from province

[1] For further discussion of the various tools available to Canadian municipalities and their revenue generating potential, see: Ploeg, C. V. *New Tools for New Times: A Sourcebook for the Financing, Funding and Delivery of Urban Infrastructure*, Canada West Foundation, Calgary, 2006.

to province. A substantial amount of research has been done on this issue and it will not be dealt with in this report[2]

1.1 Methodology and Limitations

In researching for this report, an effort has been made to identify examples of EPR strategies that have been implemented effectively in Canadian municipalities. From there an attempt has been made to highlight any relevant factors that have contributed to their success and/or areas of potential improvement, and offer suggestions for further research. A majority of the research for this report involved locating studies and articles that have analyzed the effects of EPR strategies as they have been used employed by Canadian municipalities. Web-based searches of government publications and think-tank websites, as well as searches on databases accessed through the Simon Fraser University library provided a majority of the references used for this report. Specific databases that were consulted include ECONLIT, Canadian Research Index and SourceOECD.

This study faced several limitations. First, time constraints created a number of issues. Primary research was not possible and it was necessary to rely on secondary information to identify 'best practices'. The examples discussed in this report were chosen, at least in part, because their effects have been analyzed and the results have been reported. Ideally, information regarding the results of these strategies would have been obtained directly from the relevant municipality.

[2] For further information on the powers of Canadian municipalities see: Kitchen and Slack, "New Finance Options for Municipal Governments", 2003 and Thompson, "Legal Authority for Market-Based Instruments in Municipal Environmental Regulation in Alberta, Ontario, British Columbia and Nova Scotia", 2009.

Although, in some cases, an effort was made to contact certain municipal governments to obtain information, not one responded, making it necessary to rely on scholarly articles, non-governmental organizations (NGO), and reports from other levels of government to identify 'best practices'. This means that, despite an extensive search, it's possible that there are more appropriate examples of EPR strategies in place in Canadian municipalities than the ones discussed in this report. The fact that much of the research on EPR has not been compiled makes an exhaustive search difficult.

Time was not the only limitation for this study. In reviewing EPR strategies in Canadian municipalities, the research was limited to English reports. This was particularly an issue for strategies related to transportation as much of the information provided by l'Agence Métropolitaine de Transport (AMT), Montreal's metropolitan transportation agency, could only be located in French.

1.2 Structure of Report

The structure of the report is as follows:

- Section 2 will discuss the importance of EPR strategies for sustainable municipalities;
- Sections 3 through 8 will examine and discuss examples of EPR strategies that have been implemented successfully in Canadian municipalities;
- Section 9 will review what research has been done on the topic of EPR in Canada and identify any gaps and potential for future research.

Sections 3 through 8 identify examples of EPR strategies as they have been used to address various issues. These issues include land use strategies, automobile use, water and energy conservation, waste management, and sustainable building.

2: IMPORTANCE OF EPR FOR SUSTAINABLE MUNICIPALITIES

EPR represents an important opportunity for Canadian municipalities. In certain cases, EPR strategies can generate revenue for municipal governments through the introduction of fees or shifting of taxes. In other cases they can generate financial savings by encouraging conservation of costly resources. However, the appeal of EPR strategies is that they often have the ability to do both. The fiscal imbalance at the municipal level in Canada is well documented[3]. Canadian municipalities currently struggle to maintain services to residents while trying to deal with rapid population growth, increased pressure to compete on a global level to attract business and skilled labour, and increased responsibilities due to 'offloading' from provincial governments without comparable financial transfers. At the same time, Canadian municipalities still rely heavily on property taxes as their greatest source of revenue. Given the current financial constraints, EPR offers Canadian municipalities a unique opportunity to address environmental issues while diversifying their revenue streams.

[3] For further discussion on the fiscal imbalance faced by Canadian municipalities, see: Slack, "Fiscal Imbalance: The Case for Cities", 2006.

Identifying 'best practices' is an important step for promoting EPR strategies for Canadian municipalities. Environmental issues tend to be interrelated, meaning that there may be several ways to address a particular problem. For example, issues related to air quality may be addressed by a number of methods such as reducing automobile use, reducing consumption of electricity, and/or widespread installation of green roofs. Furthermore, the flexibility of EPR strategies means that there are often several ways to achieve a particular goal. Reducing automobile use could be done by lowering fares for public transit or by increasing the cost of automobile use. This flexibility makes designing and implementing EPR strategies effectively a somewhat complex process. Also, because they are often implemented as just one part of a broad environmental strategy, it is often difficult to identify specific effects of EPR strategies. For these reasons, predicting outcomes from the implementation of these strategies becomes problematic and findings from regions where they have been implemented becomes particularly valuable. If these strategies are already in place, even if they have not been successful in achieving their goal, there are lessons that can be learned and applied in other jurisdictions. In this sense, even failures can be as helpful as successes in terms of the information they can provide. The purpose of this report, aside from identifying 'best practices' is to determine if the examples that are discussed can provide any lessons, positive or negative, for how EPR strategies can be implemented effectively in other jurisdictions.

3: ISSUE 1: ADDRESSING LAND USE CHALLENGES

EPR can be an effective tool for addressing a number of land use challenges. These challenges include increasing density around transit nodes, protecting and maintaining agricultural lands and wildlife areas, maintaining and increasing 'green space' within urban areas, and reclaiming brownfield sites. Municipalities currently have a number of financial and economic tools at their disposal to address these issues. Density bonuses, tax increment financing (TIF) as well as other tax abatements, development cost charges (DCC), and fuel tax surcharges are some examples of measures municipalities can use to create incentives and encourage more sustainable development.

3.1 Examples

This section will focus on the use of EPR to address specific land use challenges. Although only four examples are discussed here, EPR strategies have been used by a number of municipalities in Canada to address land use challenges. The examples discussed here have been chosen because they represent appropriate cases of effective EPR and because the effects of the programs have been measured and analyzed.

3.1.1 Increasing Density around Traffic Nodes

Village de la Gare: Mont Saint Hilaire, Quebec

The Village de la Gare in Mont Saint Hilaire is considered the first master-planned, transit-oriented development (TOD) in Quebec. In 2000, l'Agence Métropolitaine de Transport (AMT), Montreal's municipal transit authority,

established a commuter line linking the south shore of the St. Lawrence River to Montreal and planned to extend service to Mont Saint Hilaire. At the time, a private developer, CBL, owned the land adjacent to the existing rail lines in Mont Saint Hilaire. The AMT considered this a prime location for the proposed station and parking facilities, which prompted them to enter into negotiations with CBL to buy a portion of the land. Along with providing transit to the town, the AMT also sought to establish a compact development around a central transit node (on the area owned by CBL) to promote transit use and limit greenfield development in surrounding region. The AMT negotiated a partnership with CBL and the Town of Mont Saint Hilaire to establish what would be known as Village de la Gare (CMHC, *Transit-Oriented Development*, 2007).

In order to encourage TOD, the AMT established a number of incentives to ease development costs for CBL. These included:

- Sharing of infrastructure costs among partners. Roads and other infrastructure within the development were covered by CBL while the municipality covered the costs for roads linking Village de la Gare with neighbouring communities;
- Marketing. The municipality incorporated promotional material for the development into its existing marketing campaign.
- Planning support. The municipality created the Plan d'implantation et d'intégration architecturale (PIIA), which established zoning and land-use conditions, architectural guidelines and transit-oriented strategies for the site (CMHC, *Transit-Oriented Development*, 2007).

Some aspects of the project are still under development and the project is scheduled for completion in 2012. From the developer's perspective, the project has been a

commercial success. Property values have risen significantly since the start of the project and the units are in high demand. The project has also been successful from a planning perspective, according to the results of a survey conducted among residents in 2006. Proximity to transit was the most frequently cited main reason for moving there and 44% of residents reported using public transportation as their main mode of transportation to work, nearly double the average for the Montreal central metropolitan area (CMHC, *Transit-Oriented Development*, 2007).

3.1.2 Protecting/Maintaining Agricultural Land and Wildlife Areas

Sector and Gradient Approach to Development Cost Charges: Kelowna, British Columbia

The city of Kelowna introduced its first development cost charges (DCC) bylaw in 1988. Since they were introduced, DCCs have varied depending on location to reflect the fact that more centralized developments required lower capital investments for infrastructure than developments on the city's periphery. Along with being a better reflection of the true costs of development, the new DCCs also had the effect of encouraging densification in central locations and discouraging sprawl and 'greenfield' development (that is, development of agricultural land and other undeveloped wild lands) (Tomalty, *Innovative Infrastructure Financing*, 2007).

Since their introduction, Kelowna's DCCs have undergone some changes. In the 1990's, as more research was conducted on the costs related to development, the city found it could obtain even greater economies on infrastructure costs by encouraging more dense development. DCCs were amended to vary based on a development's proximity to existing infrastructure and also by density (that is, they

are considerably higher low density developments). Currently, Kelowna's DCCs vary by density and geographic location (Tomalty, *Innovative Infrastructure Financing*, 2007).

Results of Kelowna's DCC design are difficult to measure since the effects are not quantifiable. It is believed that the sector-based DCC approach has helped the city optimize its infrastructure investments while its public consultation program has enabled it to adjust appropriately with market trends. Again, because this initiative is part of a broader program with other factors at work, its specific effects are difficult to single out. However, the DCCs are considered to have successfully contributed to more compact and infrastructure-efficient development, which is in line with the city's smart growth objectives (Tomalty, *Innovative Infrastructure Financing*, 2007).

3.1.3 Maintaining/increasing 'green space' and open space for recreation

Density Bonuses: Ucluelet, British Columbia

Ucluelet is a small community on Vancouver Island approximately 300 km north of Victoria. The community had traditionally relied on its fishing and forestry industries to sustain its economy. However, declines in those industries led the municipal council to shift its focus to tourism in order to sustain itself. The council recognized early on the need to take a proactive approach to community development and began reviewing its Official Community Plan (OCP) in 2003. In 2004, the council implemented the revised plan and several EPR tools were included. One key feature of the revised plan was the introduction of density bonuses. Under the new plan, developers may be given permission to build at a

higher density provided they supply the municipality with parkland, cash or other amenities. The municipality also uses density bonuses to promote higher energy efficiency standards. Developers may receive a 5% density bonus if they choose to build developments that comply with Leadership in Energy and Environmental Design (LEED) guidelines (District of Ucluelet, 2009).

The implementation of density bonuses has resulted in a number of benefits for the municipality. These include:

- Approximately $9 million in combined cash, parkland and other amenities including a skateboard park and a basketball court;
- Increased retention of greenspace. Under the new plan, between 40% and 60% of natural greenspace on development properties must be retained (compared to the BC provincial average of 5%);
- Increased population density. Overall density has increased by between 20% and 30% in areas where the density bonus applies (FCM, *Best Practices Guide 2006*, 2006).

The introduction of density bonuses in Ucluelet has enabled the municipality to take a proactive approach to development while generating revenue that can be used to promote other sustainable development practices. Other areas where density bonuses have been used to encourage sustainable development are Sidney, BC and Toronto, ON (Marbek, *Sustainable Community Planning*, 2009).

3.1.4 Reclaiming Brownfield Sites

Environmental Remediation and Site Enhancement (ERASE) Program: Hamilton, Ontario

In 1997, the city of Hamilton, Ontario began consultations with the Province of Ontario on the use of financial incentives to stimulate and encourage

redevelopment of brownfield properties in a 3400 acre older industrial area. Aside from redeveloping the underutilized land, the program was also intended to increase property tax revenues for the city and the province, reduce sprawl and its associated costs, and encourage infill development in the city core by attracting private investment (CMHC, *ERASE*, 2005). The 'ERASE' program received provincial approval and was implemented in mid-2001, representing the first comprehensive brownfield redevelopment plan in Canada (NRTEE, *Cleaning up the Past*, 2003).

As mentioned, the program offered a number of financial incentives to attract developers. These incentives include grants towards the cost of environmental studies, planning and development fee rebates, and tax-increment financing (TIF) based grants (CMHC, *ERASE*, 2005). TIF is a financing mechanism that uses the increase in property tax revenues generated by the redevelopment of a property to cover costs associated with redevelopment (FCM, *Sustainable Community Planning*, 2009)). Each of these features helps to reduce costs to developers and make plans to redevelop sites in the targeted locations more financially viable (CMHC, *ERASE*, 2005).

Between 2001 (when the program was implemented) and 2007, the ERASE program produced the following results:

- A total of 19 development applications received by the city;
- Total construction expenditures over $168 M;
- Remediation and redevelopment of over 103 acres of formally vacant and underutilized brownfields;
- Approximately 350 new jobs created;

- An increase in long-term annual property tax revenues of approximately $1,590,000 (City of Hamilton, 2007).

The program has won a number of development and planning awards and has been used as a model for other Canadian municipalities seeking to encourage redevelopment of contaminated or underdeveloped sites.

3.2 Lessons Learned and Other Considerations

Smart Budget: Environmental Pricing Reform for Local Governments outlines a number of EPR tools that can be used to address various land-use issues. The examples presented here represent a small portion of the overall potential of EPR. However, each is a good example of how municipalities can implement these measures to effectively address issues that are specific to a particular municipality but could also be modified for use elsewhere.

There are a couple of trends from these examples worth noting. First, there is the problem of measuring success. For the Kelowna and Mont Saint Hilaire examples, the results are not easily quantifiable. The goals in these cases are quite broad and success is hard to define. For the Ucluelet and Hamilton examples, the results are quantifiable. However, the lack of established goals in these cases makes it difficult to determine how effective the policies have been and whether or not they are working as well as they could. All of these examples represent cases where the municipality is at least moving in the right direction. Specified targets and indicators would allow for a more rigorous analysis and would help to ensure municipalities are getting the most out of their EPR tools.

Another thing that is worth noting is that each of the policies discussed in this section (with the possible exception of Ucluelet) is a result of public consultation and research. In the case of Mont Saint Hilaire and Hamilton, policies were developed based on negotiations with municipal stakeholders, developers and the community. In Kelowna, research was conducted to gain a better understanding of the costs related to municipal developments. The flexibility of these policies means that they can be applied in virtually any Canadian municipality for a wide range of purposes. However, these examples show that the use of incentives alone may not be sufficient to achieve particular goals. A solid understanding of the issue is needed to ensure that policies are designed properly.

4: ISSUE 2: REDUCTION OF EXCESS AUTOMOBILE USE/INCREASED USE OF SUSTAINABLE TRANSIT

The transportation field offers significant potential for the use of EPR in Canada. Roads and other transportation infrastructure are expensive to maintain, excessive automobile use encourages urban sprawl and vehicle emissions are significant contributors to a number of environmental issues. For municipalities, the costs associated with excessive automobile use (both economic and environmental) are extremely high and there is a real incentive to encourage the use of sustainable modes of transportation. There are many ways that EPR can be used to accomplish this, although they all tend to involve the same general principle: increase the cost of driving a car (via tolls, taxes, fees, etc.) while making the use of

sustainable transit more convenient. Virtually, all municipalities in Canada promote sustainable transit in one way or another. However, the use of EPR is still not common practice in Canada for a couple of reasons. This section will identify some cases where EPR strategies have been implemented in Canadian municipalities as well as highlight some areas where these strategies are lacking and there is room for improvement.

4.1 Examples

Two types of examples are discussed in this section. The first type includes taxes and fees designed to discourage excessive automobile use. These are user fees that effectively increase the cost of using an automobile relative to other modes of transportation. The second includes programs designed to encourage the use of sustainable modes of transportation. Fees are not the only tool municipalities can use to encourage sustainable transit and programs to promote bicycle use and car-sharing can also be effective. However, these programs are generally funded from general revenues rather than revenues from charges that discourage automobile use. The two programs discussed in section 4.1.2 are operated by municipal transit authorities: Metrolinx in Toronto and TransLink in Vancouver respectively. The funding for each is generated, at least in part, through initiatives aimed at discouraging excessive automobile use, making them appropriate examples of EPR strategies in accordance with the rules established in *Smart Budget*.

4.1.1 Fuel Tax, Parking Tax and other Fees

Fuel Tax: Montreal, Quebec; Vancouver, British Columbia; Victoria, British Columbia

In Canada, certain municipalities have the ability to piggyback additional fuel taxes on top of provincial and federal fuel taxes. The motivation for this type of tax is to discourage automobile use by effectively raising the cost of driving while using revenue to fund sustainable transit options. In some cases (i.e. Calgary and Edmonton), the revenues generated by this tax are placed in a provincial infrastructure fund, to which municipalities must apply for grants for proposed projects. In other cases, the revenues are transferred directly to the regional transportation authority. This is the case in Montreal, Vancouver and Victoria where taxes of $0.015/L, $0.12/L and $0.025/L are charged respectively (Tomalty, *Innovative Infrastructure Financing*, 2007). For Vancouver and Victoria, the funds are also used to finance the maintenance of roads, bridges and other automobile related infrastructure, whereas in Montreal, the funds are used exclusively for public transit. In Vancouver, where the regional fuel tax is highest, the tax generated $262M in 2008 (Translink, *2008 Annual Report*, 2008).

Measuring the success of this tax is difficult. Automobile use is affected by a number of factors besides taxes and identifying the specific effect the fuel tax would be a complex process. So far, no attempt has been made to do so. Despite this, the fuel tax represents an appropriate use of EPR as outlined in *Smart Budget*.

Parking Sales Tax: Vancouver, British Columbia

TransLink currently collects a tax which is applied to the purchase price of paid off-street parking within TransLink's service region. The tax is currently 7%

but is set to rise to 21% in 2010. At the current rate of 7%, this tax generated approximately $14.9 M in revenue for the 2008/09 fiscal year, or roughly 1.6% of TransLink's total revenue for that year (TransLink, *Parking Sales Tax*, 2009). As with the fuel tax, this additional revenue helps TransLink fund a number of sustainable transportation initiatives such as public transportation (i.e. buses, trains, ferries, etc.), expanding the municipal cycling network, and a citywide car-share program. Again, the revenue generated by the parking sales tax is not used exclusively to finance sustainable transit initiatives since TransLink is also responsible for the maintenance of roads, bridges, and other infrastructure related to automobile use.

Measuring the success of this tax (in terms of its effect on automobile use) presents the same problems as for the fuel tax. However, this does represent an appropriate use of EPR as outlined in *Smart Budget*.

4.1.2 Cycling and Car-Share Programs:

BikeLinx: Toronto, Ontario

BikeLinx is a program that was implemented by Metrolinx and is currently in place in 7 municipalities in the GTA. The program began in 2007 when Metrolinx approved $5M in funding for the Inter-Regional Bicycle Expansion project. The money would was intended for 2300 new bicycle-carrying devices for buses as well as secure parking facilities for bicycles at strategic locations in the participating municipalities. The overall goal was to promote bicycle transit as a viable alternative to single occupant vehicle use by making certain aspects of bicycle transit more convenient (Metrolinx, *Community Initiatives*, 2009).

So far, the effect on bicycle transit has not been measured. However, the program has generated positive feedback from the participating municipalities, cycling organizations, and other enthusiasts who see cycling as a legitimate form of green transportation.

Car-Sharing: TransLink (Vancouver) and the AMT (Montreal)

Both TransLink and the AMT have helped to support car-sharing programs in their respective cities. In Vancouver, TransLink has encouraged the Co-operative Auto Network (CAN) by providing designated parking spaces for CAN vehicles at select locations along SkyTrain routes. Also, in 2005, the city of Vancouver passed a by-law reducing the number of parking spaces required in new developments provided the developers offer a car-share program as an amenity. The by-law currently allows for a reduction of three parking spaces for every co-operative car (and associated parking space) provided by the developer (Co-operative Auto Network, *The Car Co-op and Developments*, 2009).

In Montreal and Laval, Communauto, a car-sharing network operating in several municipalities in Quebec, began offering transit users the option of a Duo Auto + Bus pass in 2005. The pass provides users with a Communauto membership and a public transit pass at a reduced rate. As of April 2007, there were 58 subscribers (AMT, *2008 Annual Conference*, 2008). Both of these programs represent cases where regional transit authorities have reinvested revenues generated, at least in part, by programs designed to discourage automobile use back into programs that support sustainable transit.

4.2 Lessons Learned and Other Considerations

EPR strategies to reduce excessive automobile use and promote sustainable transit are underutilized in Canadian municipalities and best practices are difficult to locate. This is due to a number of factors. First, the costs to automobile users do not reflect the actual costs to governments of all levels to provide automobile-related infrastructure. Automobile transit is generally underpriced in Canada and many of the costs associated with driving (i.e. insurance, registration fees, residential parking fees, etc.) are either fixed or not related to road use (Marbek, *Transportation Sector*, 2009). Also, road and bridge tolls are also relatively rare compared to other countries. As of 2005, there were only 19 operational tolled facilities and a total of 385km of tolled roads in Canada compared to 8000km in the United States and most of these facilities are not under municipal control (Lindsey, 2005).

Another problem is ensuring that revenues from automobile-related fees and taxes are properly reinvested. Where fees and taxes are in place to discourage automobile use, the revenues generated are not necessarily reinvested into sustainable transit programs. Only three municipalities in Canada (Montreal, Toronto, and Vancouver) have municipal transportation authorities in place to oversee all matters related to transportation (i.e. roads, bridges, public transit, cycling, etc.). In these municipalities, revenues generated from automobile-related fees are used specifically for transit related expenses. In all other jurisdictions, any revenues generated tend to end up in the municipalities' general revenues and may not be reinvested in sustainable transit alternatives. While the fees and taxes may

still discourage excess automobile use, without promoting other alternatives, transit users may have no other option but to simply incur the additional costs and continue using their automobile. Transportation strategies are most likely to be successful if implemented conjunction with other support strategies and these support strategies may involve the cooperation of multiple jurisdictions. Implementing a municipal transit authority (or at least a broad regional transportation plan) can help to ensure that multiple strategies complement one another and ensure that revenues generated from taxes and fees are reinvested into sustainable modes of transportation.

5: ISSUE 3: REDUCTION OF STRAIN ON FRESHWATER SYSTEMS

EPR can be used in several ways to reduce the strain on freshwater systems. Certain methods, such as those that address high demand, are present in many Canadian municipalities. The most common demand-side management (DSM) technique is metering combined with some form of volume-based pricing scheme (as opposed to simply charging a flat rate regardless of consumption). In 2004, a survey regarding municipal water use was conducted by environment Canada. Of the 916 municipalities that responded, 427 (representing 76.6% of the population) employ a volume-based pricing scheme (Renzetti, *Wave of the Future*, 2009). Other DSM techniques include incentive programs for installing high efficiency fixtures

(i.e. showerheads, toilets, etc.) and appliances. These are also present in Canadian municipalities although they are not as common as volume-based pricing schemes.

It is also important to consider wastewater when discussing initiatives to ease the strain on freshwater systems. Contaminated wastewater must be treated before being discharged back into the water system. This process can be very costly for municipalities and there is the possibility that treatment may not remove all the contaminants from the water, meaning that those contaminants are discharged into the water system. EPR measures aimed at reducing the amount of contaminants in wastewater, as well as reducing the total amount of wastewater that needs to be treated, could be beneficial to municipalities. Each of these methods will now be discussed in terms of how they have been implemented in Canadian municipalities and what lessons can be learned.

5.1 Examples

5.1.1 Volume-Based Water Pricing

Vernon, British Columbia: Universal Water Metering

In 1994, the city of Vernon, British Columbia shifted away from charging residents a flat fee for water services and implemented a volume-based rate structure. This was done for a number of reasons. First, high consumption was driving up operating costs. More importantly, high wastewater flows had forced the city to consider either expanding its treatment facilities or to begin to discharging treated wastewater into Okanagan Lake, neither of which was very appealing. The city had had policies in place for over a decade to facilitate this shift. In 1982, a by law was passed requiring all water meters to be installed on all new homes and the

city had been tracking water use in those homes since 1991. Initially, an increasing block pricing structure was used but this has since been switched to a uniform consumption rate. The city complemented this new rate structure with a program to retrofit homes with conservation devices (i.e. toilet tank water savers, low-flow shower heads, faucet aerators) and an extensive public education campaign. The retrofits were installed at the same time as the meters to minimize any inconvenience for residents (Webb, 2009).

As a result of these initiatives, residential water consumption dropped by 35% over the next 10 years (25% as a result of metering and 10% as a result of the retrofit programs) and wastewater was reduced by 5%. The initial investment in meters and water efficient fixtures was estimated at $1.2M, plus an additional $15,000 per year in ongoing costs for public awareness programs. The reduction in water consumption allowed the city to save approximately $2M by deferring capital investments and $56,000 per year in costs to the utility (i.e. energy savings, cost of chlorine, etc.) (Waller et al., 1997).

5.1.2 Subsidies for Retrofits and Other Water Efficient Practices

Barrie, Ontario: Subsidy for Efficient Fixtures

In 1994, the city of Barrie, Ontario faced a potential water shortage due to rapid population growth. To address this problem, the city planned to increase water supply by incorporating a new source of surface water at a cost of $27M. Following this, wastewater flows began to reach capacity at the Water Pollution Control Centre, prompting the city to consider renovating the facility in order to keep up. The expansion would have cost an additional $41M. This high cost led the

city to consider other less expensive options. In an attempt to reduce the need for the expansion, the city partnered with the Ministry of the Environment and Ontario Clean Water Agency to fund a program focused on reducing the city's per capita water consumption by upgrading the toilets and fixtures for 15,000 households. The city offered residents a rebate per toilet of $145 and per showerhead of $8, effectively lowering the cost of those goods. The goal of the program was to reduce per capita water consumption by 50 L per day for the 15,000 households (United States, *Cases in Water Conservation*, 2002).

Between 1995 and 1997, 15,000 high-efficiency toilets were distributed to 10,500 households at a cost of $4.1M to the city. The program produced the following results:

- Average reduction of per capita water consumption of 62L/day for participating households, which translates to an average of 55L/day for the entire system;
- General satisfaction among participants. 90% of participants reported being satisfied with the program and products installed;
- A deferral of the planned expansion to the pollution control centre. The reduction in consumption enabled the city to defer the expansion for 5 years and scale back the cost of the upgrade to $19.2M, saving the city $21.8M or $17.1 after subtracting the cost of the rebate (United States, *Cases in Water Conservation*, 2002).

By effectively lowering the cost of water efficient fixtures, the city was able to reduce the long run supply costs by avoiding a costly infrastructure expansion.

5.1.3 Effluent Charges

The use of economic instruments to discourage the discharge of pollutants is currently not common in Canada. There is very little legislation in place at the federal and provincial levels, let alone the municipal level. An extensive web-based search, as well as a comprehensive search of several databases specializing in topics such as economics and Canadian public policy identified no appropriate examples of EPR strategies designed to reduce the emission of contaminants at the municipal level. The Canadian Water and Wastewater Association (CWWA) maintains a Water Efficiency Experience Database (WEED) which contains information on water conservation strategies in place in Canadian municipalities. No appropriate examples were found in the database either.

5.2 Lessons Learned and Other Considerations

Although only two examples are discussed here, the use of EPR strategies to encourage water conservation are widespread in Canada. There are literally hundreds of appropriate examples that could have been discussed here. However, many municipalities continue to charge flat rates for access to water services and the use of more effective pricing structures (in terms of promoting conservation) are rare. Also, as noted in section 5.1.3, no appropriate examples of policies designed to address the effect of effluent on water treatment costs could not be identified. Given the amount of research that has been done on the subject of municipal water use in Canada, there is a significant amount of room for improvement in this.

Water fees are user fees for access to the municipal water system. *Smart Budget* identifies several general rules for designing an efficient user fee. A well designed user fee should be paid by users, should not be regressive, the price should be set to ensure a full recovery of costs of supply (financial as well as environmental), and prices should be scaled to reduce consumption at all levels of the income spectrum (Thompson and Bevan, *Smart Budget*, 2010[4]). Given these rules, many municipal water pricing structures are not well designed. First, although they are volume-based, most employ a uniform charge rather than an increasing block structure where prices rise as consumption increases. Not only are increasing block pricing structures progressive rather than regressive, and therefore more in line with Sustainable Prosperity's design rules, they are also more effective at encouraging conservation than other pricing structures. According to the Environment Canada survey, as of 2004 only 39 municipalities (representing 23.3% of the population) reported employing an increasing block structure (Renzetti, *Wave of the Future*, 2009). Despite the benefits, few municipalities have employed the more efficient pricing structure.

Pricing structures aside, water is generally underpriced in Canadian municipalities. Canadian water rates are among the lowest of OECD countries while consumption rates are among the highest. With the exception of 2001, revenues generated by municipal water suppliers fell short of expenditures. Since 2001, the ratio of revenues to expenditures has been falling and sat at approximately 70% as

[4] See Thompson, David and Andrew Bevan. "Smart Budget: A Background Paper on Environmental Pricing Reform for Local Governments." Prepared for Sustainable Prosperity: 2010.

of 2007 (Renzetti, *Wave of the Future*, 2009). Current water fees are not covering the financial costs (let alone environmental costs) of supply. Although increasing block structures are in place in some regions, many municipalities need to reconsider their pricing schemes to try to encourage more efficient use of water.

6: ISSUE 4: REDUCTION OF AMOUNT OF SOLID WASTE BEING SENT TO LANDFILLS

The use of EPR to address municipal waste issues is widespread in Canada. As of 2005, approximately 200 municipalities had implemented some form of variable fee structure to make waste disposal costs more visible to residents and to try to encourage diversion of waste away from landfills (Kelleher et al., *Taking out the Trash*, 2005). They generally come in the form of pay-as-you-throw (PAYT) programs (where residents pay for waste removal on a volume basis), increased tipping fees at landfill facilities, and fines on contaminated loads (that is, waste that has not been source-separated) (FCM, *Getting to 50%*, 2009). In terms of how these programs are designed, the same general rules apply as for other user fees. That is, they should be paid by users, they should not be regressive, prices should be set to ensure a full recovery of costs (financial as well as environmental), and prices should be scaled to reduce consumption at all levels of the income spectrum (Thompson and Bevan, *Smart Budget*, 2010).

6.1 Examples

The following cases represent examples of where municipalities have used EPR to address the issue of municipal waste diversion. These cases were chosen because, in each case, the user pay system has been in place long enough for its effects to be monitored and analyzed.

6.1.1 Example 1: Victoria Capital Regional District (CRD), British Columbia

In 1992, the CRD implemented new waste dispersion program aimed at diverting waste away from the city landfill with an overall goal of 50% per capita waste reduction by 1995. This came as a response to the fact that the landfill being used by the municipality was almost at capacity and there was significant public opposition to either expanding the landfill or creating a new one. The main features of the new program were as follows:

- Raising the tipping fee for using the landfill from $10.50 per tonne in 1988 to $75 per tonne in 1993;
- Altering the rate structure to a flat-plus-variable rate. Residents were charged a flat annual fee ranging from $100 to $140 (depending on their municipality) plus an additional fee of $1.50 to $2.50 per each additional bag of garbage over the allowable limit of one;
- Using revenues generated from increased tipping fees to fund alternatives to traditional waste disposal. These included a regional blue-box program, a subsidized program for the distribution of backyard composters, and centralized municipal facilities from disposing of compost, yard waste and other materials (Moffet, 1994).

The program resulted in an estimated 18% reduction in waste collected in the core municipalities in 1992 and a regional reduction of 36% by 1995. The program was

successful in reducing the amount of waste being sent to the municipal landfill although it did not achieve its goal of 50% diversion. The CRD has since augmented its diversion goal (as well as its tipping fee and residential disposal rates) to 90% by 2020 with zero waste being its guiding principle (CRD, 2008).

6.1.2 Example 2: Owen Sound, Ontario

In 2005, the City of Owen Sound committed to implementing a long-term waste management strategy. At the time, the city lacked access to neighbouring disposal sites and exported its residual wastes to a landfill site in Michigan. Exporting waste presents a number of challenges since it forces any municipality to rely on political and regulatory factors beyond its control. Rather than establishing local landfill facilities (which can generate significant opposition and take years to accomplish), the City of Owen Sound chose to take a more proactive approach. The city set goals for waste diversion and implemented a number of measures to help reach those goals. The following features were included in the new strategy:

- A goal of 60% by 2010 and 70% diversion by 2015;
- A restructuring of the user pay system. When the user pay system was introduced in 1999, residents were issued 52 'courtesy tags' per year. That number was reduced to 35 in 2005 and is eliminated under the new program. Residents are now allowed to dispose of 4 bags every two weeks and must place a tag on each bag (at a cost of $2.00 per tag);
- Expansion of the existing recycling and composting programs to include a wider range of materials and to make participation more convenient for residents. Also, recycling is now mandatory;
- An education strategy aimed at informing residents of ways they can reduce the amount of waste they produce (Leppard, 2007).

In the first two years after the implementation of the user pay system, the disposal rate for curbside waste dropped 21%. The diversion rate increased enough that the city was able to switch to bi-weekly garbage collection in July 2009.

6.2 Lessons Learned and Other Considerations

Despite the numerous examples of economic instruments in place to address municipal waste concerns, 'best practices' are difficult to identify for a number of reasons. First, in each of these examples, the use of EPR was part of a broad strategy. EPR is most effective at encouraging waste diversion when implemented in coordination with other initiatives (Moffet, 1994). For a program aimed at reducing the amount of municipal waste a city generates to be successful, residents must have alternatives to curbside disposal. If no alternatives exist, then implementing a PAYT system will simply force residents to incur higher costs. A large part of the success of these two programs is attributable to range of alternatives that residents were offered, such as the expansion of recycling and composting programs. While increasing the likelihood of success, implementing a range of programs makes the specific effects of specific instruments (i.e. user pay systems) difficult to isolate. In addition, although both programs included goals for overall waste reduction, goals were not set for each component of the program. That is, there was no specific goal for waste reduction by adopting a user pay system. Without a defined goal or a way to identify the specific effects of the user pay system, it is difficult to label these cases as effective uses of EPR.

Another factor that makes identifying successes difficult is the fact that PAYT programs are generally not 'well designed'. Despite successfully encouraging the diversion of waste away from landfills, the fees charged in PAYT systems tend to be regressive and the revenues do not recover the full financial costs of municipal waste collection, let alone the additional environmental costs. In the case of Owen Sound, the estimated revenue generated from the sale of bag tags was to be used to help pay the city's disposal costs. After the first year, it was acknowledged those revenues would fall short of the city's estimates. However, rather than alter the price to reflect the cost of disposal, the city simply lowered its estimate for expected revenues for the following year (Leppard, 2007). The Association of Municipal Recycling Coordinators (AMRC) has identified some general rules for effective pricing of residential waste in Ontario but has also found that fees charged by neighbouring municipalities tend to play the biggest role in how municipalities set their fees (Kelleher, *Household Fees and PAYT Rates*, 2009). Despite, the success of PAYT systems in terms of increased waste diversion, more consideration could be given to the design of the user fee.

7: ISSUE 5: REDUCTION OF ELECTRICITY CONSUMPTION

EPR tools for energy consumption are essentially the same as those for water consumption (with the obvious exception of charges related to wastewater which do not apply). DSM measures to promote energy conservation generally come in the form of progressive rate structures and subsidy programs that create incentives for

residents to install energy efficient retrofits in their homes. However, the situation regarding pricing structures for electricity is different in that flat rate structures for electricity do not exist. In Canada, users generally pay for the amount they use. In order to create an incentive to reduce consumption, utilities have begun experimenting with non-uniform pricing schemes and peak pricing. This section will review these efforts. Non-uniform pricing schemes are essentially user fees; so once again, the same general rules for the design of user fees apply.

7.1 Examples

7.1.1 Non-Uniform Price Structure

In recent years, Canadian utilities have begun to experiment with EPR in the form of with non-uniform rates for electricity consumption. In British Columbia, BC Hydro has had a two-tiered rate structure in place since 2008 and the Ontario Energy Board has had a similar structure in place since 2005 (Ontario Energy Board, *Regulated Price Plan*, 2009). The introduction of a two-tiered rate structure involves the establishment of a threshold for energy consumption. Users are charged a rate for each unit (in this case, kWh) they consume at or below that threshold and are charged a higher rate for every additional unit above the threshold. In theory, implementing this type of pricing structure will induce users to conserve energy due to the higher financial costs at higher levels of consumption. BC Hydro began experimenting with two-tiered pricing structures in select regions in 2006. Prior to implementing the structure for the entire province, it had recognized the significant

opportunity for reducing municipal demand and used this as motivation for doing so (BCUC, *Revenue Requirements*, 2009).

Unfortunately, because these pricing structures have been in place for such a short period, the results of their implementation have not been analyzed to determine how successful they have been at addressing demand. Also, these are provincial initiatives. In regions where municipalities have control of generating services (ie. EPCOR and ENMAX in Alberta), uniform rates are still in place (Enmax, 2009).

Certain municipalities in Ontario have begun to offer varied rates based on time-of-use (TOU). The goal of TOU pricing is to try to reduce peak demand, thereby reducing the strain on the energy grid. TOU pricing is made possible by the installation of smart meters, meters that not only measure how much electricity is consumed but also what time of day it is consumed at. These are not in widespread use yet, but the Ontario Energy Board has estimated that 3.6 million (out of approximately 4.3 million total) Ontario energy consumers will be on TOU rates by June 2011 (OEB, 2009). Again, discussion of results is not possible at this point since the program is still very new.

7.1.2 Retrofit Incentive Programs

Home Performance Rating Rewards Program: Peterborough, Ontario

In 2000, Peterborough Green-Up (a non-profit established by the City of Peterborough), in partnership with the Ontario Ministry of the Environment, the local utility and the Green Communities Association, launched a program offering financial incentives to residents who made efforts to increase the energy efficiency

of their homes. The program was used as a pilot program and was intended to assess the effect of financial incentives for inducing residents to upgrade their homes, and establish estimates for the cost of complying with EnerGuide standards as well as expected savings to the participants. Residents who wished to participate had their homes inspected and were given a rating based on how their home scored on the *EnerGuide for Houses* rating system. Residents were given the opportunity to make improvements and have their home re-inspected. Based on the difference between the pre-improvement and post-improvement ratings, residents were assessed a cash rebate of up to $2800. Rebates were distributed on a first come first serve basis due to program budget constraints (CMHC, *Financial Measures*, 2003).

The program ran from October 2000 to March 2001 and produced the following results:

- 268 initial ratings conducted with 195 households eligible for rebates (well above targets of 200 initial ratings and 100 eligible for rebates);
- Rebates covered 27% of costs of retrofits (average rebate was $841, average gross retrofit cost was $3076);
- Average annual space heating savings of 34%;
- Average CO_2 savings of 3.8 tonnes per house per year (CMHC, *Financial Measures*, 2003), .

Although modest in size, this program represents a successful use of incentives to encourage investment in retrofits. Analysts have identified several key contributors to that success. First, the link between efficiency gains and financial benefits increases the credibility of the program. Second, the results are easy to measure, making it easy to determine if the program is achieving its goals. Finally, the rebate

amount was set at a high enough rate (close to 30% of retrofit costs), to induce participation without simply reimbursing participants for retrofits they would have otherwise installed (CMHC, *Financial Measures*, 2003). This program has served as a model for a similar federal program as well as other municipal programs in Ontario.

7.2 Lessons Learned and Other Considerations

The use of EPR strategies to encourage energy conservation is relatively uncommon at the municipal level in Canada. This is not due to the fact that Canadian municipalities are trailing other jurisdictions, but because certain factors are beyond the control of most Canadian municipalities (i.e. the price of electricity) and because of the significant number of federal and provincial programs. First, Canadian municipalities are generally not responsible for supplying energy. This does not prevent them from offering financial incentives for certain actions that reduce energy consumption, but it does limit their ability to alter the price and the pricing structure to further encourage conservation, as was discussed in Section 7.1.1. Also, because energy suppliers need to supply energy to an entire grid and not just one municipality, conservation efforts are generally more effective when targeted at a regional level.

Natural Resources Canada's Office of Energy Efficiency maintains a database of programs at each level of government in Canada aimed at encouraging energy conservation. Searching specifically for 'financial incentive or tax measures' at each level of government identifies 36 at the federal level, 73 at the provincial level and 10 at the municipal level across Canada (Natural Resources Canada, *Directory*,

2009). Not all of these programs are appropriate examples of EPR as the term is being used in this report; however, it does highlight the fact that there are relatively few energy conservation programs in place in Canadian municipalities compared to other levels of government. In general, EPR strategies to encourage energy conservation at the municipal level are underutilized.

8: ISSUE 6: ENCOURAGEMENT OF 'GREEN' DEVELOPMENT

'Green' development is quickly gaining popularity in Canada. Many Canadians take pride in supporting environmental initiatives so it is not hard to understand why 'building green' is becoming a hot topic. But green developments make economic sense as well. Some of the economic benefits associated with green buildings include higher productivity, longer life cycles and therefore lower long-term operating costs, and higher property values, just to name a few. These benefits more than outweigh any additional costs incurred in the development and construction phases. 'Green' building standards can also provide financial benefits to municipalities through in stormwater flow reduction, improvement in air quality and reduction in urban heat island effect. Canadian municipalities are beginning to implement policies to encourage the use of 'green' roofs and compliance with LEED standards. In some cases, EPR has been used to create incentives. Although these policies are not currently widespread, there is evidence to suggest that they could be in the near future.

8.1 Examples

This section will examine instances where these policies are in place and what the results have been.

8.1.1 Green Roof Incentive Pilot Program: Toronto, Ontario

A 'Green' roof is a traditional roof with features that support the growth of vegetation in order to provide improved drainage, insulation, and/or vapour control (Lawlor, *Green Roofs*, 2009). These roofs can provide a variety of benefits including the conservation of water and energy and enabling stormwater capturing. Since 2000, the city of Toronto, Ontario has been taking steps to promote the use of green roofs and it is currently one of the only cities in Canada with programs in place to encourage their construction. Financial incentives have been in place since 2006 when they were first approved by the city council in response to extensive stakeholder consultation and a cost-benefit study that identified significant financial savings (from reduced water infrastructure costs, among other things) as a potential benefit of widespread green roof implementation (City of Toronto, *Staff Report*, 2007).

The Green Roof Incentive Pilot Program ran from 2006 to 2007. The main feature of the program with respect to EPR was access to grants of up to $\$10/m^2$ towards the installation of a green roof up to a maximum of $20,000 for all eligible applications. Property owners from all sectors (i.e. residential, commercial, institutional and industrial) were eligible, but a majority of applications were

received from the residential sector (City of Toronto, *Staff Report*, 2007). The results of the pilot program were as follows:

- Applications for 16 sites approved, each qualifying for a financial incentive of $\$10/m^2$;
- Total of $3000m^2$ of green roof space installed before the end of 2007;
- $30,000 total expenditure out of a budget of $200,000 (City of Toronto, *Staff Report*, 2007).

While the program did result in the installation of some green roofs, the uptake of the benefits was not as high as was expected and the program was not very effective. The main criticism of the program was that the grants were too small relative to the costs of installing green roofs. This would explain the lower uptake rates for larger commercial and industrial buildings where total costs are much more significant (City of Toronto, *Staff Report*, 2007). This problem would be addressed in future programs.

The city of Toronto currently provides incentives for the installation of green roofs through the Eco-Roof Incentive Program. This program was implemented in 2009 and was designed to address some of the problems with the original pilot program. The Eco-Roof program also provides incentives for the installation of 'cool' roofs: roof systems with high reflectivity and high thermal emissivity that are designed to reduce the urban heat island effect. Also, incentives are now only available for commercial, industrial, and institutional buildings (City of Toronto, *Eco-Roof Incentive Program*, 2009). Currently, the main features of Toronto's green roof policy with respect to EPR are as follows:

- Grants of up to $50/m^2 towards the installation of a 'green' roof up to a maximum of $100,000 for eligible applicants;
- Grants of $2 - 5/m^2 towards the installation of a 'cool' roof up to a maximum of $50,000 for eligible applicants (City of Toronto, *Eco-Roof Incentive Program*, 2009).

Since the program was implemented just this year, it is still unclear if the changes have increased its effectiveness.

8.1.2 Density Bonuses: Ucluelet, British Columbia

The District of Ucluelet offers a very straightforward example of the use of EPR (in this case, density bonuses) to promote 'green' development. In Ucluelet, developers may receive a 5% density bonus if they choose to build developments that comply with Leadership in Energy and Environmental Design (LEED) guidelines. This example was already discussed in section 3.1.3. For more information, please refer to that section.

8.2 Lessons Learned and Other Considerations

It is difficult to draw useful conclusions from the examples discussed in this section. In the case of Ucluelet, it is unclear how many developments have received density bonuses as a result of complying with LEED standards and Toronto's Eco-Roof Incentive Program has only been in place for a couple of months. As was mentioned in Section 8.1.1, Toronto's previous green roof incentive program faced problems because the incentives were to low relative to the cost of installing a green roof. More information is necessary to determine whether or not these programs are currently well designed. In the case of Toronto, this will take some time.

Other municipalities are beginning to use development cost charges and other financial incentives to encourage sustainable development but these practices are not yet widespread. The benefits of certain practices (i.e. green roofs) are just beginning to be fully understood while in other cases, municipalities lack the capacity to use fiscal levers (such as the use of development cost charges in Ontario (FCM, *Energy Sector*, 2009)). One potential reason for the slow uptake in Canadian municipalities is that the potential for financial benefits of 'green' buildings are not fully understood. The main benefits tend to be savings from reduced energy costs and the fact that most Canadian municipalities are not responsible for supplying energy means that there is less incentive to encourage conservation. However, 'green' buildings can save municipalities money in other ways as well. The implementation of 'green' roofs alone has the potential to save municipalities millions of dollars in stormwater flow reduction, improvement in air quality and reduction in urban heat island effect (Ryerson, 2005). As these benefits become more well known, it is likely that EPR strategies to promote 'green' buildings will become more widespread in Canadian municipalities.

9: SUMMARY OF GAPS IN KNOWLEDGE & EXPERIENCE

There is currently both significant potential for further implementation of EPR strategies in Canada and opportunity for further research. In terms of implementation, Canadian municipalities are currently not taking advantage of the full potential of EPR strategies. Even strategies for which the benefits are widely

known continue to be underutilized. For example, metering household water consumption charging a volumetric rate has been found to significantly lower household water consumption and supplying municipalities can be extremely expensive for municipal governments. However, many municipalities continue to charge a flat rate and offer no incentive to residents to reduce their consumption. Given the amount of knowledge on the benefits of metering, there is no reason why any municipality in Canada should continue to charge a flat rate for water. In this case, EPR strategies represent an opportunity that many Canadian municipalities are not taking advantage of.

Where EPR strategies are in place, greater attention needs to be paid to the monitoring and reporting of results. As mentioned earlier, several of the cases in this report were included not necessarily because they represented 'best practices' but because their results have been analyzed and reported and showed some indications of success. Without reported results, identifying appropriate examples and drawing useful conclusions becomes extremely difficult. EPR strategies, like any policy, need to be monitored to ensure they are having the intended effect. If this is done properly, lessons can be learned and other municipalities may learn from the results, whether they are positive or negative.

Research on the of EPR tools varies greatly from issue to issue. For example, information on EPR tools to address issues such as water conservation and waste diversion is fairly common whereas information on the use of EPR strategies to encourage electricity conservation is not. The following section will discuss the state of knowledge for each topic in greater detail.

9.1 Suggested Further Reading by Topic

This section identifies experts and relevant studies on the subject of environmental strategies at the municipal level in Canada. They have been organized according to the topics discussed in this report.

Land Use Challenges

Research on EPR strategies used to address land use challenges is fairly scattered, mainly because there are a number of issues related to land use. The CMHC is a good source of information on issues such as TOD and brownfield remediation. Also, the FCM as recently published a series of reports that discuss 'best practices' related to municipal land use. The reports review 'best practices' in the community planning, water management, energy management, and transportation sectors. Although none of these reports exclusively examines land use challenges, the broad nature of land use issues means that they affect several different sectors. Also, the reports look at a wide range of strategies Canadian municipalities have employed and not simply EPR. Finally, Ray Tomalty is a Canadian expert on smart growth and urban sustainability. He is a professor in the Urban Planning Department at McGill University and has researched and written extensively on the use of EPR strategies to address land use challenges.

Excessive Automobile Use

As with land use challenges, there is a wide range of issues related to excessive automobile use and research on the subject is fairly scattered. Once again, the FCM research reports cover issues related to the transportation sector including TOD and automobile-related taxes. However, they do not cover charges such as

congestion charges or road tolls. Robin Lindsey is a professor of economics at the University of Alberta specializing in transportation economics. He appears to be a leading researcher in the field and has published several reports in the last couple of years on the state of road pricing in Canada. Research on the design and effectiveness of alternative transit programs (i.e. car-sharing, cycling, etc.) does not appear to be widespread.

Water Consumption

A considerable amount of research has been conducted on water pricing and other EPR strategies to encourage conservation in Canada. Steven Renzetti is an expert on the economics of water resources. An economist and professor at Brock University in Ontario, he has written extensively on the topic of water pricing (residential and industrial) and the use of economic incentives to encourage conservation in Canada.

There are several other sources of information on EPR strategies related to water consumption. Environment Canada collects statistics on pricing, consumption and DSM strategies for Canadian municipalities. The CWWA maintain a database on municipal strategies to encourage conservation. Finally, as mentioned, the FCM recently published a comprehensive report detailing best practices in the water management sector for Canadian municipalities.

Waste Diversion

Much of the research on EPR strategies for the waste management sector tends to focus on PAYT programs. In Canada, two individuals appear to be leading researchers in the field. Marie Kelleher, founder of Kelleher Environmental, is an

environmental consultant and researcher. Her clients include federal, provincial and municipal governments, industry associations, not-for-profits, NGOs, law practices and consulting companies.

Lisa Skumatz is another expert in the waste management sector. She is an economist and waste management consultant based out of Colorado. Although most of her work is done in the United States, she has Canadian clients and has written several reports for the Fraser Institute (among others) on Canadian waste management issues.

Energy Use

As mentioned in Section 7.2, Natural Resources Canada's Office of Energy Efficiency maintains a database on Canadian energy efficiency programs at the federal, provincial and municipal level. This is a good source of information on the current practices in Canadian municipalities. However, the information tends to be more descriptive than analytical and information on the effects and results of specific programs can be difficult to locate. In some cases, there is no evidence that the effects of the programs are being monitored.

Research on the effects of non-uniform pricing schemes and TOU pricing is also difficult to locate. BC Hydro ran pilot programs in British Columbia to study the effects of a two-tiered pricing scheme and used the results as justification for implementing the structure across the rest of the province. Reports from the pilot programs were not consulted for this report but would be useful for other municipalities and utilities looking to reduce demand for electricity. TOU has not been in place in Ontario long enough to measure the effects.

'Green' Buildings

There has not been a considerable amount of research done on the use of EPR strategies to encourage the construction of 'green' buildings. As mentioned, the FCM recently published a comprehensive report detailing best practices in the energy sector for Canadian municipalities. Although most of the report deals with municipal initiatives not related to EPR, there is a section on the effective use of financial incentives. Aside from the FCM, the CMHC also conducts research on issues related to sustainable development, in particular 'green' roofs. They have compiled a list of best practices regarding 'green' roofs for Canadian municipalities although none of the cases they highlight represent appropriate examples of EPR. Also, a group from Ryerson University in Toronto prepared a report on the benefits of 'green' roofs for the city of Toronto in 2005. The report provides a detailed discussion on the potential for financial benefits resulting from widespread 'green' roof implementation. The report is available on the City of Toronto website: http://www.toronto.ca/greenroofs/pdf/fullreport103105.pdf.

10: CONCLUSIONS

The examples discussed in this report indicate that there is significant potential for EPR strategies to be implemented effectively in Canada. In each case, the municipality in question was able to achieve an environmental goal and in many cases the EPR strategy enabled the municipality to do so either at a lower cost than would have otherwise been done or while either generating revenue for the local

government. Given the current fiscal imbalance faced by Canadian municipalities, as well as the growing concerns among Canadians for environmental issues, EPR strategies offer a unique opportunity for local governments. However, with the exception of policies to encourage conservation of water and waste diversion, EPR strategies are generally underutilized in Canadian municipalities. This means that there is great potential for further research and further implementation. Several organizations and government departments (i.e. the FCM, the CMHC, Environment Canada, etc.) are currently leading the way in terms of research on the status and potential for EPR strategies in Canadian municipalities. However, more work could be done to help inform local governments of the potential benefits of EPR as well as 'best practices' for implementation. Specifically, more effort should be put into monitoring EPR strategies that are currently in place and analyzing and reporting the results. This would both ensure that policies that are in place are working properly and inform local governments in other regions of what EPR strategies are capable of. Without adequate reporting of these policies, it is not likely they will be implemented in new jurisdictions.

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