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2011 Municipal Water Pricing Report

Municipal Water Pricing 2009 Statistics

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Introduction

Access to drinking water and sanitary sewage collection is important for both Canadians' health and our economic vitality. While Canadian homes and businesses have historically enjoyed an abundant supply of high-quality, affordable water and wastewater services, these benefits should not be taken for granted. Maintaining and improving the high standard of water and sanitary services that we desire for our communities will require significant investment in water and wastewater infrastructure, as well as wise and efficient management and use of water.

The provision of drinking water and sanitation services already represents an important portion of local governments' budgets, and yet, in order to undertake necessary repairs and maintenance of existing infrastructure, expenditure in this area will have to increase. It has been estimated that Canadian municipalities currently face some \$31 billion to repair and maintain the existing capital stock, and an additional \$56.6 billion for new infrastructure (Mirza, 2007).

Meanwhile, some parts of the country are facing—or will soon face—water shortages. While Canada has 7% of the world's renewable freshwater supply, these water resources are not always available where and when they are needed. In fact, while 84% of the population lives in a narrow southern band, 60% of our water supply flows north (Environment Canada, 2011b). The increasing urbanization of our society, which concentrates people and resource consumption in growing urban areas, also places pressure on those ecosystems that supply water to our cities.

The pricing of water and wastewater services is an important aspect of both water conservation and the generation of revenue needed to maintain and expand infrastructure. The *2011 Municipal Water Pricing Report* provides information on how and how much Canadian homes and businesses pay for water and wastewater services. It includes updates (2009 data) of statistics that were published in summary tables for 2006 data. This water pricing report complements the companion [2011 Municipal Water Use Report: 2009 Statistics](#), which highlighted key statistics associated with water use in Canadian municipalities.

All data in this report was collected through the Municipal Water and Wastewater Survey (MWWS). This survey—along with its predecessor, the Municipal Water Use and Pricing Survey (MUD/MUP)—has been conducted every two or three years by Environment Canada since 1983. The resulting data can be analyzed in several ways, such as by survey year, province/territory and size of municipal population.

For the complete set of statistics produced from the 2009 cycle of the MWWS, please refer to the MWWS Summary Tables (2009 Statistics) that are available online.¹

An explanation of the terminology used in this report can be found in the glossary found at the end of the document.

¹ The water use reports, pricing reports, survey questionnaire, and municipality-level water use and pricing databases and variable description documents are available from the "Water" section of Environment Canada's website at www.ec.gc.ca/eau-water. To find the MWWS survey page, click on "Water Research" in the left-hand column.

Methodology

The 2009 MWWS collected data on municipal water use and pricing for the 2009 calendar year.

Survey sample

The survey was sent out to all municipalities with a population greater than 1000 and to a sample of those under 1000, except municipalities on Federal Lands and First Nations.

The sample of municipalities with less than 1000 residents increased to 1000 municipalities in the 2009 survey, compared to 630 in 2006 and 616 in 2004 (no municipalities below 1000 population were included in the 2001 or previous surveys). In spite of this change, the data is still comparable to previous survey cycles, as any effect on the aggregate statistics is negligible due to the very small overall population of responding municipalities in this size group.

The 2009 survey sample contained a total of 2779 municipalities, compared to the 2006 sample of 2409 municipalities. Forty municipalities that were included in the 2006 sample were merged into existing or new municipalities or districts in the 2009 sample. An additional 410 municipalities were added to the 2009 sample, including 400 additional municipalities with population below 1000 (as mentioned above), and another 10 municipalities that crossed the 1000 population threshold and were therefore automatically included in the survey sample.

The population estimates used for each municipality are based on Statistics Canada's population estimates for census subdivisions on July 1, 2009.

Response rate and representativeness

The response rate to the survey varies by question; please refer to the "Responding Population" column in each table in the document *Municipal Water Pricing: 2009 Summary Tables* (available on the web site indicated in footnote 1) to find the exact responding population for each statistic.

Initial survey responses were supplemented with call-backs to large municipalities and Internet searches for readily available information. Some missing records were imputed from data collected in 2006, after adjusting for changes in the population in the intervening years. In the 2009 MWWS Pricing Summary Database, the source of each record (2009 survey or imputed from 2006) is indicated; therefore the non-imputed totals or averages can be obtained, if desired.

In 2009 the survey collected information on one or more key statistics from 1488 municipalities (with a population of 27.0 million). Imputing from 2006 for non-response where possible brought these values up to 1688 municipalities, accounting for 30.0 million Canadians. Looking only at the data on water and wastewater pricing and water conservation, the 2009 MWWS collected information on one or more key statistics from 735 municipalities (20.4 million Canadians).

The data reported here has been compiled directly from values collected through the 2009 MWWS. No statistical techniques or extrapolation has been used to render the information representative of the entire Canadian population. When interpreting the survey results, the reader should always refer to the responding population, which is indicated for each statistic presented in this report.

Changes since 2006

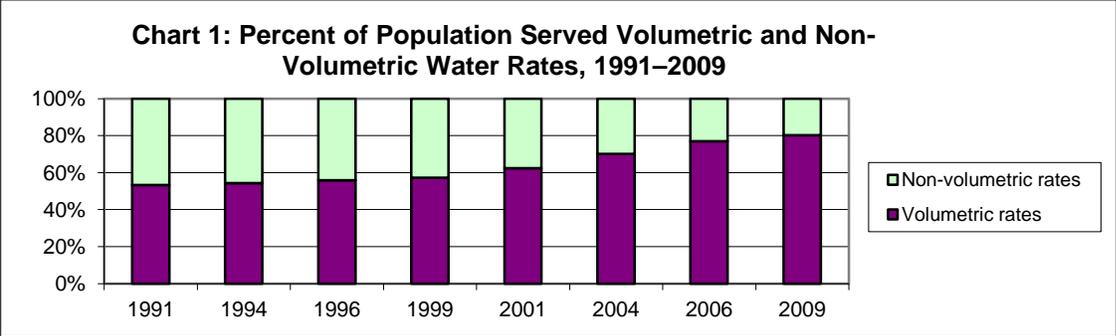
The MWWS underwent revisions and modifications since the 2006 survey cycle. Changes made to the survey questionnaire and to the method of data analysis have allowed greater clarity and precision in survey results. However, in some cases these changes have affected the comparability of the 2009 results with previous cycles' data. In 2006 and previous survey cycles, where a municipality had more than one pricing scheme (e.g., for different water distribution systems or different areas of the municipality), only that which applied to the largest number of people was retained for the analysis. In 2009, all of the various pricing schemes and their associated population were retained. In addition, the 2009 analysis only used imputed data from 2006 in the analysis of water and sewer rate type, while the 2006 analysis used data imputed from several previous survey cycles for many of the statistics.

Survey highlights

Use of volumetric rates continue to rise across Canada

Charging for water and sewer services on a volumetric basis allows the utility to send a price signal to consumers to conserve water. Of course, volumetric pricing can only be implemented when water meters are used to measure consumption. Data from 2009, as reported in the *2011 Municipal Water Use Report: 2009 Statistics*, shows that residential metering increased from 63.1% in 2006 to 72.1% in 2009, while commercial metering increased from 80.1% in 2006 to 86.7% in 2009.

In tandem with the increased adoption of water meters in Canadian communities, the use of volumetric rates has increased steadily over the past couple of decades. Chart 1 shows the proportion of residential clients that pay for water through non-volumetric rates and through volumetric rates.²



² The reader should take note that the percentage of the population served volumetric rates is higher than the percentage of the population served residential metering because the method of data collection does not permit an exact breakdown of population served volumetric and non-volumetric rates. Data is collected by water distribution system, and if a given water distribution system has both volumetric rates (for metered clients) and non-volumetric rates (for unmetered clients), the entire population served by the distribution system is considered to have volumetric rates. This problem is mostly avoided by requesting that respondents report separately for metered and unmetered parts of the distribution system, but sometimes this is not possible.

Most customers served non-volumetric water rates pay a flat rate. Only a small percentage of the population (3.3%) pays for water through an assessed tax, which is most commonly based on property value, lot size or the number of plumbing fixtures (e.g., toilets).

For commercial clients (i.e., small store/office, max. 1" connection), non-volumetric rates make up only 10% of the total, which reflects the higher incidence of metering in commercial establishments.

Increasing block rates continue to lose ground to constant unit rates

When water is charged by volume, one of several rate structure types can be applied. Each type has different consequences for promoting water conservation and for the revenue generated from water rates. See Box 1 for a brief explanation of each rate type.

Box 1: Rate Types

Tax/Assessed charges

The amount paid for water and/or wastewater services is not based on the volume of water used but differs depending on customer attributes like property value, frontage and number of plumbing fixtures.

Flat/Fixed rate

Customers pay a fixed amount regardless of their consumption. All customers of the same type (e.g., residential – single family) pay the same amount.

Block rate

A type of volumetric rate where several preset consumption blocks are associated with a different unit price for water. For each billing period, the customer pays the unit rate of the lowest block until that consumption level is exceeded, at which point he or she pays the unit rate of the next block until that consumption is passed, and so on.

- Increasing block rate (IBR): The unit price of water increases in successive blocks of the rate schedule.
- Decreasing block rate (DBR): The unit price of water decreases in successive blocks of the rate schedule.

Constant unit charge (CUC)

Customers are charged a uniform amount per unit of water used per billing period.

Minimum charge

A minimum charge, which applies to metered accounts only, is the minimum charge for each billing cycle, even if no water is consumed.

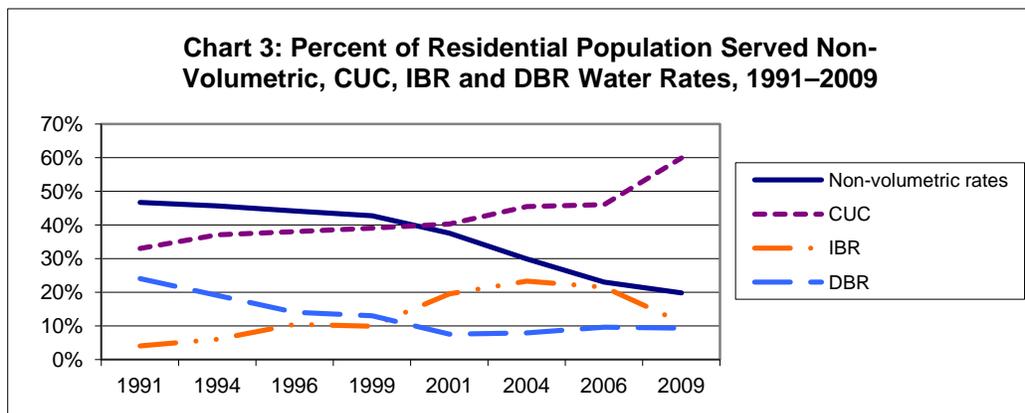
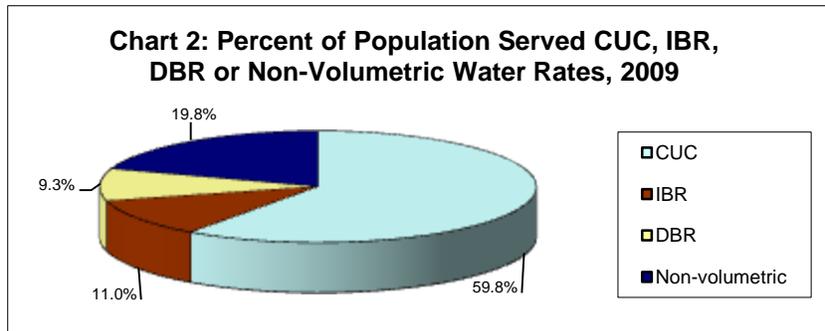
Base charge

A base charge, which applies to metered accounts only, is a flat charge that is charged each billing cycle, in addition to any volumetric charges.

The most commonly used volumetric rate type in Canada is constant unit charge (CUC), and the use of this rate type has increased steadily over the past couple of decades. Decreasing block rates

(DBR), which once applied to one quarter of the population—and 40% of customers on volumetric rates—now only apply to 9% of the population, or 12% of customers on volumetric rates.

The use of increasing block rates (IBR) increased rapidly from 1991 to 2004, but then fell slightly in 2006 and more significantly in 2009. However, this observed drop in the use of IBR is mostly attributable to the City of Toronto, which switched to a CUC rate type in 2008.³ In 2006, Toronto represented 53% of the population with IBR rates. In fact, between 2006 and 2009, more municipalities switched from another rate type to IBR, than switched from IBR to another rate type.



Likewise, for commercial clients (i.e., small store/office, max. 1" connection), the period of 2006 to 2009 saw a large increase in the use of CUC rates—68%, up from 42% in 2006—and a marked decrease in the use of IBR—3%, down from 15% in 2006. The use of DBR stayed relatively stable over this time period.

Base and minimum charges can be an important component of water and sewer rates

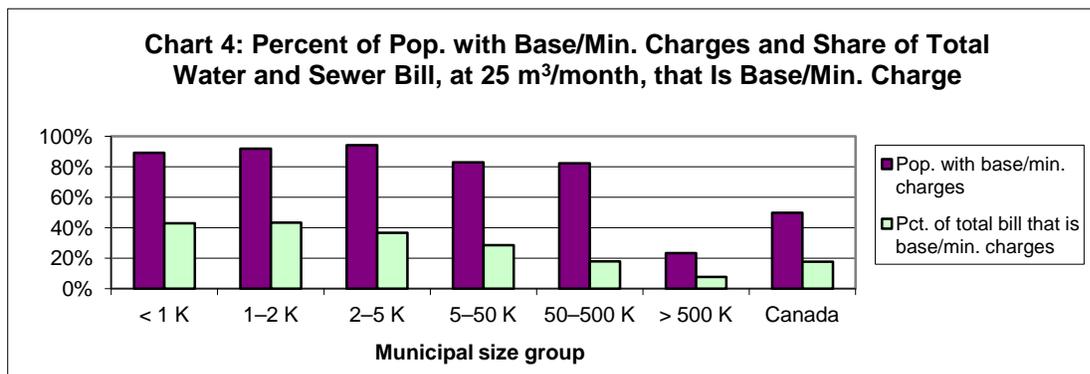
Minimum and base charges help ensure the financial stability of the utility by guaranteeing a certain minimum payment from all customers regardless of consumption.

³ Staff reports cite reduced complexity, greater equity and greater commercial competitiveness as primary drivers for the change from the previous seven-tier block rate structure (Pennachetti and Di Gironimo, 2007).

Water and wastewater utilities typically have a high ratio of fixed to variable costs. This means that costs such as infrastructure construction and maintenance—which are unrelated to the volume of water treated and distributed (or, in the case of wastewater, collected and treated)—are high relative to variable costs such as energy for pumping and treating water, chemical inputs, and, where applicable, costs associated with the purchase or extraction of raw water. While volumetric rates are important for encouraging conservation and slowing the need for infrastructure expansion, utilities must ensure that revenue from water and sewer rates does not fall below that needed to cover the cost of delivering the service. Employing base or minimum charges can help the utility ensure a certain minimum revenue.

Perhaps surprisingly, only 49.8% of the population with volumetric water and wastewater pricing face minimum or base charges for water and sewer services. However, as Chart 4 illustrates, this proportion is considerably higher (over 80%) in all but the largest municipalities. In municipalities of over 500 000 people, only 23% of the population with volumetric water and wastewater pricing faces minimum or base charges for water and sewer services.⁴

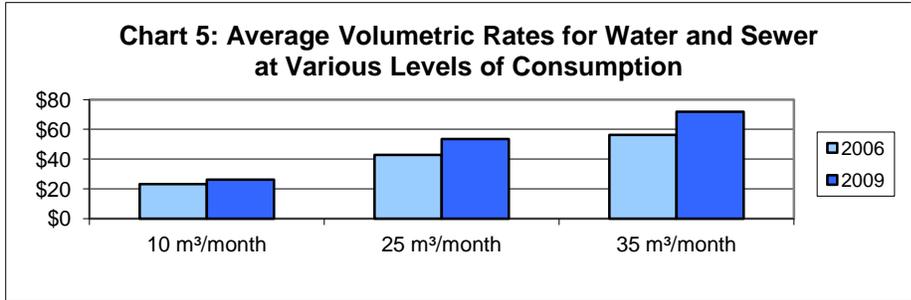
Among municipalities that use a base or minimum charge for water and sewer services, the average monthly base or minimum charge is \$10.17. At a monthly water consumption of 25 m³/month, the minimum or base charge for water represents 18% of the total water and sewer bill. As Chart 4 illustrates, the proportion of the total charge represented by base or minimum charges decreases as municipal size group increases.



Average volumetric rates for water and sewer are on the rise

As in previous survey cycles, average residential water and sewer rates were calculated for various levels of consumption (10 m³/month, 25 m³/month and 35 m³/month). Chart 5 shows the average volumetric rates for water and sewer services at these consumption levels. The 2006 results are included for comparison. At a consumption level of 25 m³/month (approximately the average consumption of a three-person household), volumetric rates rose by 24% over the period from 2006 to 2009, from \$42.91 to \$53.39. As Chart 5 illustrates, average rates rose more sharply at higher levels of consumption.

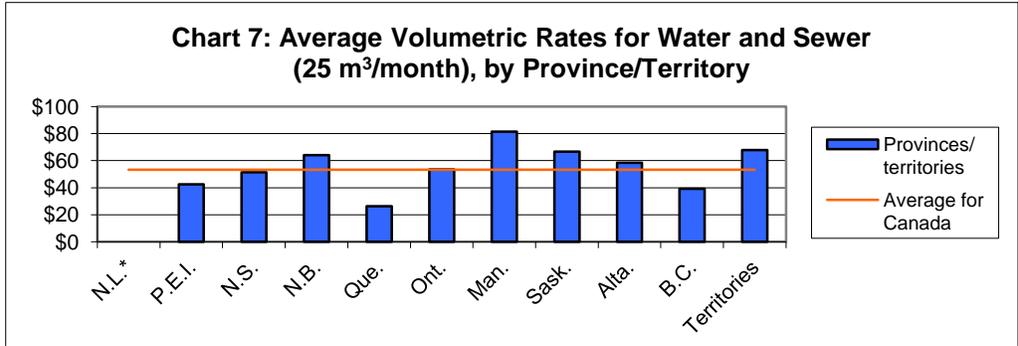
⁴ This data was not collected in 2006 and earlier cycles, but future survey cycles will allow for a comparison of the use of base and minimum charges over time.



Average marginal prices for water and sewer services have also risen since 2006. The average marginal price at 25 m³/month (i.e., the price for the 26th cubic metre of water) was \$1.84 in 2009, up from \$1.45 in 2006, an increase of 27% (see Chart 6). The fact that the average marginal price is similar at the various consumption levels indicates that the effects of IBR schemes—which result in higher marginal prices at higher levels of consumption—and DBR schemes—which result in lower marginal prices at higher levels of consumption—cancel each other out.

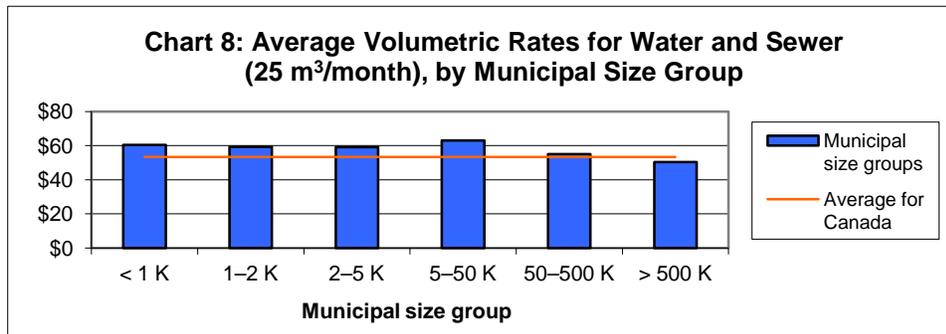


The average volumetric rates for water and sewer services vary much more by province than by municipal size group, meaning that the amount users pay for water is more strongly affected by where they live in the country than by the size of community they live in. Chart 7 shows the average monthly volumetric rate for water and sewer services by province. Average volumetric rates for water and sewer services (at 25 m³/month) ranged from \$26.35 in Quebec to \$81.38 in Manitoba.



* Not enough responding municipalities with volumetric rates to determine average.

Chart 8 shows the average monthly volumetric rate for water and sewer services by municipal size group. Average volumetric rates for water and sewer (at 25 m³/month) ranged from \$50.47 in municipalities with over 500 000 people to \$63.06 in municipalities with 5 000 to 50 000 people.



In 2009, for the first time, average residential water and sewer rates for the “average” monthly household consumption were also calculated. This was done by first calculating the average monthly water consumption per capita in each municipality, then multiplying by 2.5—the average number of persons per household in Canada (Statistics Canada, 2006)—to give the average household water consumption. Then, the water and sewer rate for that level of consumption was determined. Finally, a weighted average of the results in the sampled municipalities was taken to estimate the average water and sewer rates, for average monthly consumption, for Canada overall and by province and size group.

Chart 9 shows the average water and sewer rate, at average monthly consumption, by province/territory. Both flat and volumetric rates were included. This analysis provides a best estimation of the actual average price paid for water and sewer services in Canadian municipalities. For Canada overall, the average monthly rate was \$37.55. By province/territory, average rates ranged from \$22.03 (Quebec) to \$74.47 (New Brunswick). It is interesting to note that the result for New Brunswick is not due to high water rates but rather to a high level of per capita water consumption.

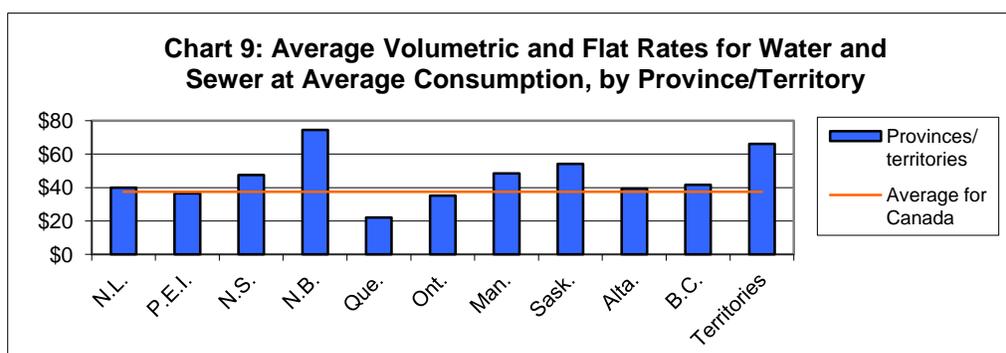
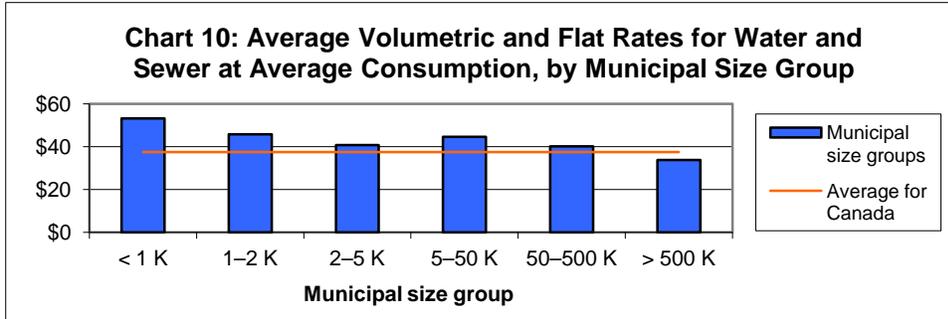


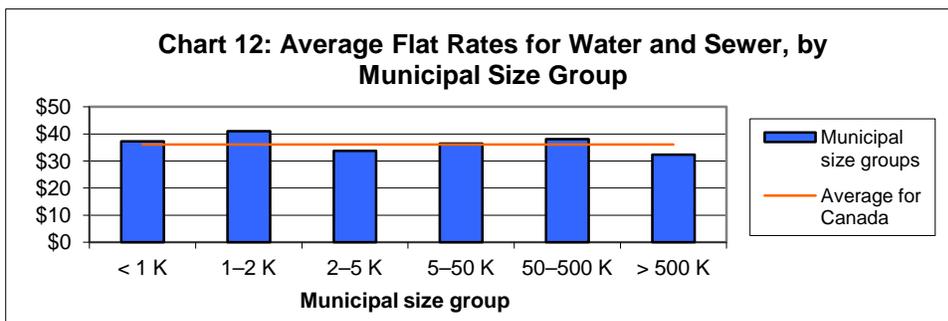
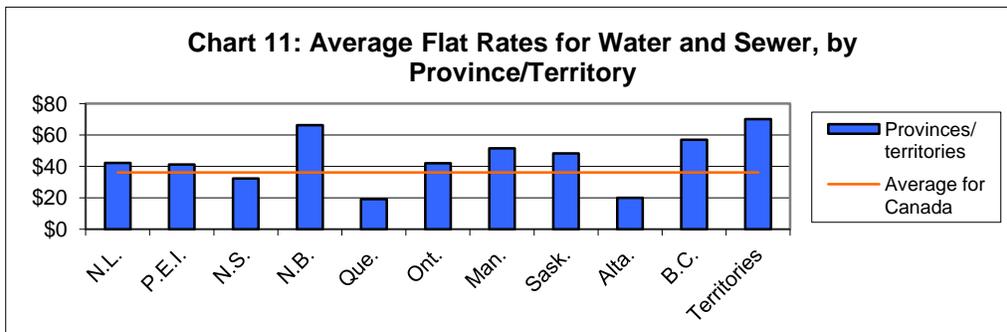
Chart 10 shows the average water and sewer rate, at average monthly consumption, by municipal size group. Again, both flat and volumetric rates were included. The average water and sewer rate diminishes, in general, as municipal population increases.



Flat charges for water and sewer vary widely across Canada

Average flat rates for water and sewer also rose over the period 2006 to 2009, although more slowly than volumetric rates. For Canada in general, average flat rates for water and sewer services rose by 9%, from \$33.00 per month in 2006 to \$36.13 per month in 2009.

Just as with volumetric rates, the average flat rate varies widely by province/territory, and less so by municipal size group, as illustrated by Charts 11 and 12.

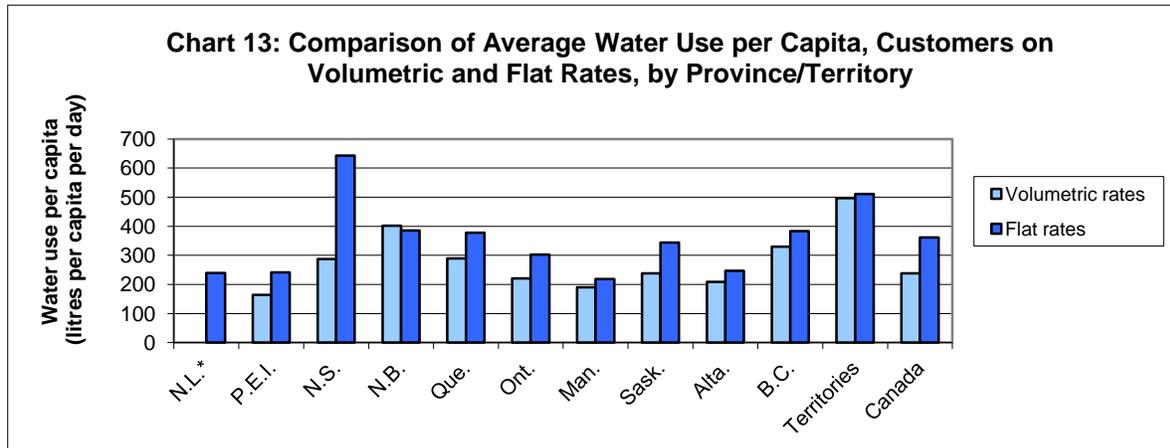


Metering and volumetric charges are strongly associated with lower per capita water use

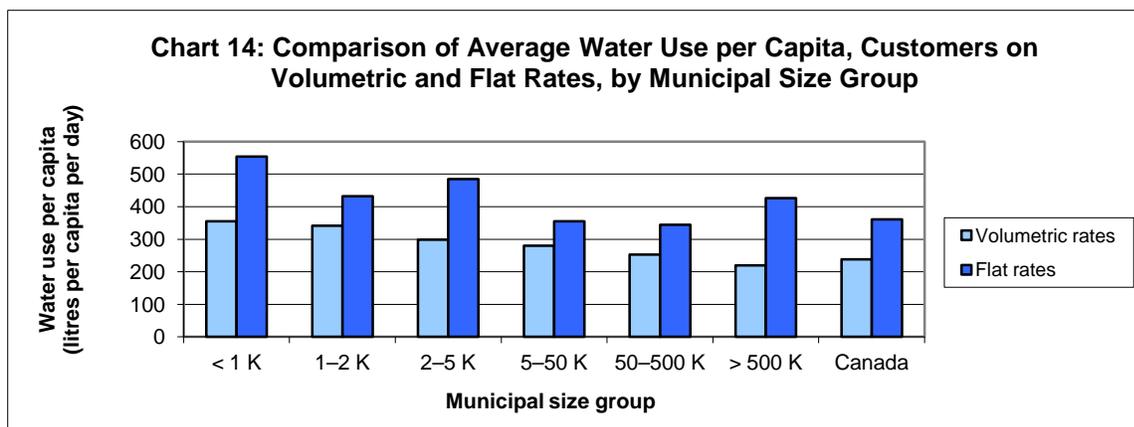
Water consumption differs greatly between customers with flat and volumetric rates. While the average residential water use per capita was 238 litres per capita per day (lcd) for the serviced population on systems with volumetric rates, it was 361 lcd (52% higher) for the serviced population

on systems with only flat rates.⁵ In 2006, average residential water use per capita was 275 lcd for the serviced population on systems with volumetric rates and 439 lcd (60% higher) for the serviced population on systems with only flat rates.

The comparison of average water use per capita for customers on volumetric and flat rates, by province/territory and by municipal size group, are shown in Charts 13 and 14. While the difference in water use for customers on volumetric or flat rates varies, water use is higher among customers on flat rates in all municipal size groups and provinces/territories except for New Brunswick, where water use is approximately the same for both types of rates.



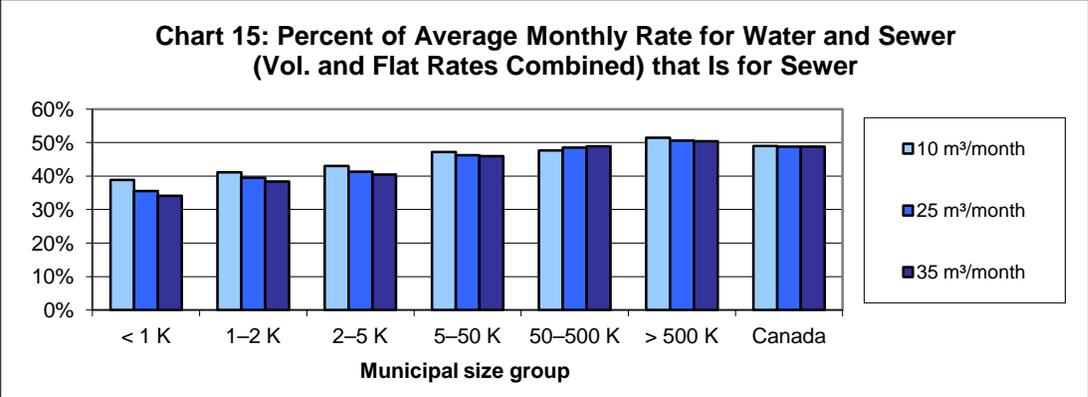
* Not enough responding municipalities with volumetric rates to determine average.



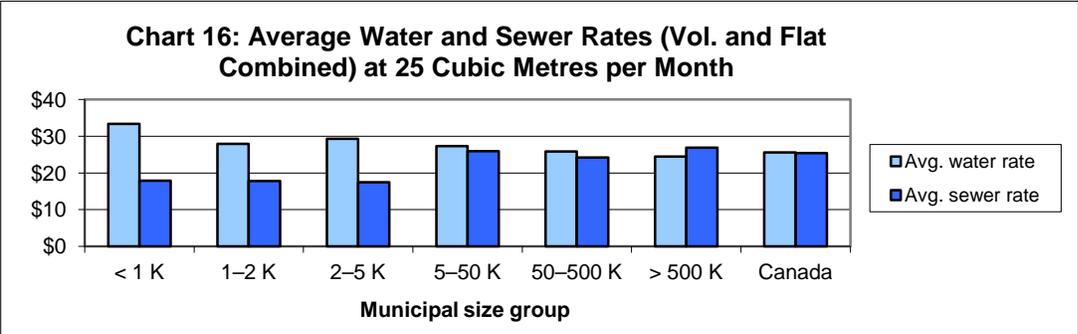
⁵ A similar analysis was reported in the *2011 Municipal Water Use Report: 2009 Statistics*. Using 100% metering as a proxy for volumetric rates and 0% metering as a proxy for flat rates, it was found that the average residential water use per capita was 65% higher for customers on systems with no metering (376 lcd) as compared to that of customers on systems with full metering (229 lcd).

Sewer charges represent approximately half the total charge for water and sewer services

Overall, sewer charges represent just under half of the total charge for water and sewer services. At a consumption level of 25 m³/month, the average sewer charge is 48.8% of the average total charge for water and sewer services, while at average consumption level, the average sewer charge is 49.4% of the average total charge for water and sewer services. As Chart 15 illustrates, the proportion of total charges that is for sewer services does not differ greatly depending on the level of water consumption.



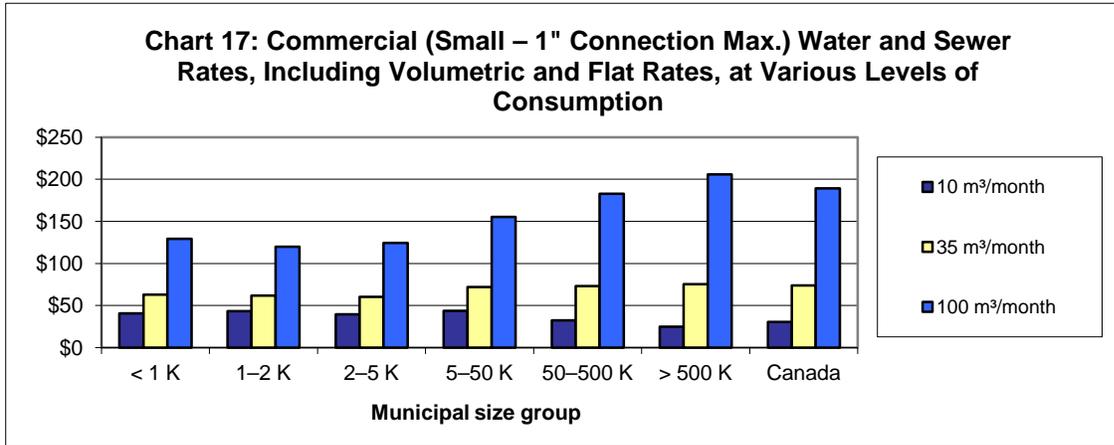
Sewer charges make up greater share of the total water and sewer bill in larger municipalities. This is because the average rate for water decreases with municipality size, while the average rate for sewer services increases. The higher prices for sewer services in larger communities may reflect the higher costs associated with more advanced treatment processes that are more widely used in larger municipalities. Chart 16 shows the average rate for water and the average rate for sewer services (volumetric and flat rates combined; consumption level of 25 m³/month for the volumetric rates) by municipal size group.



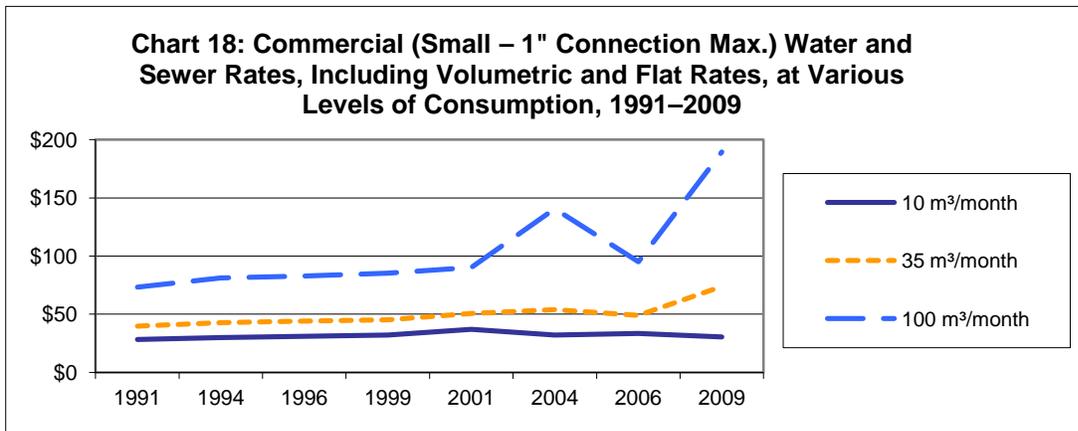
Commercial (small – 1” connection max.) rates are rising quickly for larger water users

The MWWS collects water and wastewater pricing data for small commercial establishments (with a 1” maximum water connection). Water consumption varies widely among commercial establishments based on the type of activity in which they engage. Chart 17 shows, by municipal size group, the average water and sewer rates (volumetric and flat rates combined) at various levels of

consumption. While it appears that average monthly rates decline with municipal population for commercial establishments with low levels of water consumption (10 m³/month), average monthly rates at a consumption level of 35 m³/month and 100 m³/month increase with municipal size group.



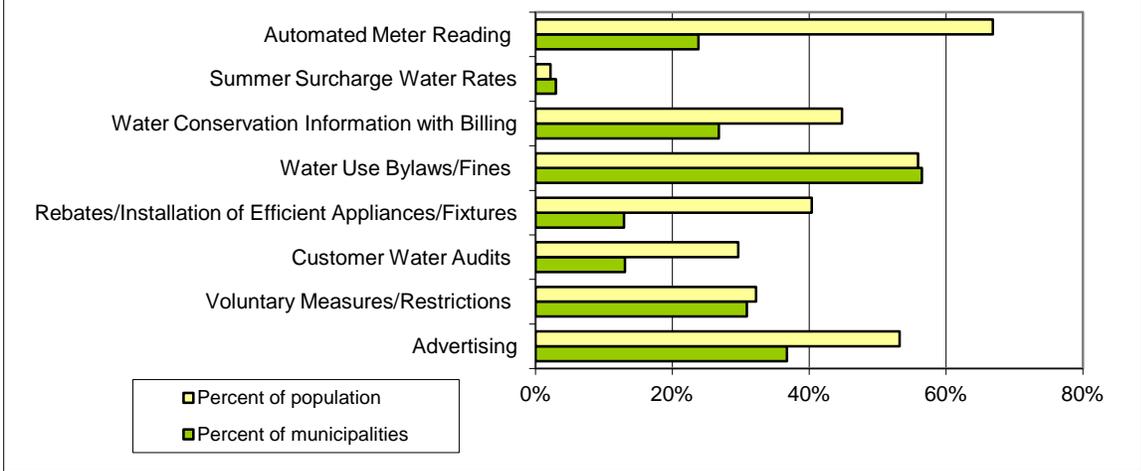
A comparison of rates from 1991 to 2009 (Chart 18) reveals that, while average rates for water and sewer services (volumetric and flat rates combined) have remained relatively stable at low levels of water consumption (10 m³/month), rates for higher levels of consumption (35 m³/month and 100 m³/month) rose sharply between 2006 and 2009.



Use of water conservation/demand management measures varies widely across Canada

Beyond the use of volumetric pricing, there are a wide variety of measures that water utilities can use to encourage water efficiency and decrease water demand. Many such measures can be oriented towards water users to encourage them to reduce their water consumption. Chart 19 shows the percentage of municipalities that employed each customer-oriented measure and the percentage of the population that are served each measure.

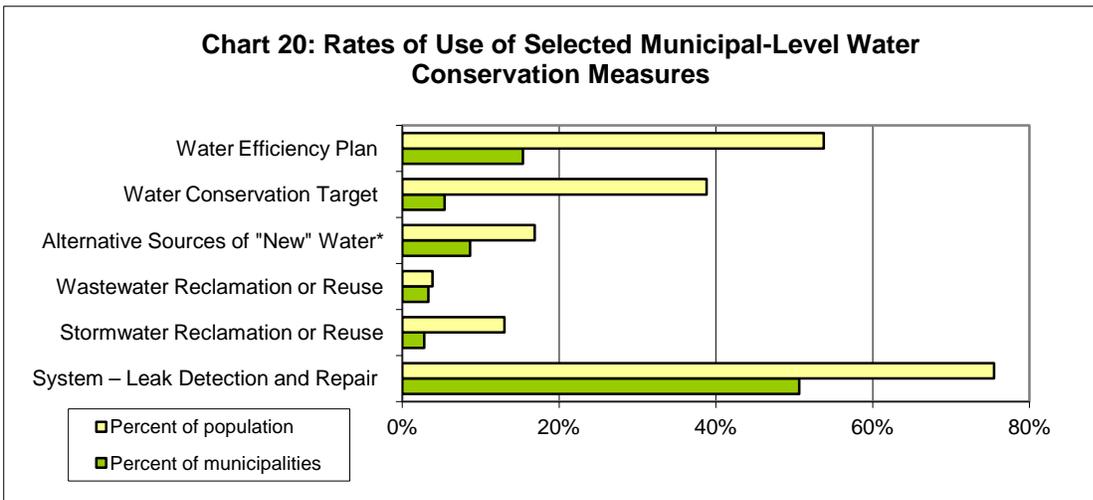
Chart 19: Rates of Use of Selected Customer-Oriented Water Conservation Measures



Other types of initiatives, implemented at the municipal level, seek to set goals and plan for greater water efficiency. Examples include the development of a water efficiency plan, the reuse of wastewater or stormwater, and leak detection and repair programs.

Chart 20 shows the percentage of municipalities that have instituted each of this kind of measure and the percentage of the population that are served each measure.

Chart 20: Rates of Use of Selected Municipal-Level Water Conservation Measures



* Municipalities that have included alternative sources of "new" water (conservation, rainwater, recovered stormwater or wastewater) in their estimations of future water demand and water supply.

While only 15% of municipalities report having a formal water efficiency plan, these municipalities represent over half (54%) of the population served by a water distribution system. This outcome underscores the finding that larger municipalities are more likely to have a formal water efficiency

plan than smaller ones. In fact, 75% of municipalities with populations over 500 000 reported having a water efficiency plan.

The recycling or reuse of municipal stormwater and wastewater is still fairly rare in Canada, except in the largest municipalities. Overall, only 3.3% of municipalities (3.9% of population served water) reported taking part in any wastewater reclamation or reuse, and only 2.8% of municipalities (13.0% of population served water) reported taking part in any stormwater reclamation or reuse. However, among the largest municipalities (over 500 000 people), 22.2% reported taking part in wastewater reclamation or reuse and 33.3% reported taking part in stormwater reclamation or reuse.

Conclusions

Understanding how Canadian communities use and charge for water is a prerequisite for gauging Canada's progress toward the sustainable use of its water resources. Environment Canada's MWWS provides information that allows the public, water managers and policy-makers alike to measure and compare different aspects of water use and pricing in the municipal sector, and to make informed decisions concerning our valuable water resources and water infrastructure.

The 2009 MWWS pricing results show that average water and sewer rates have been rising throughout Canada, although regional variations in rates are quite large. Volumetric rates have risen at a faster rate than flat rates. As in past survey cycles, customers that pay for water through volumetric rates use considerably less water per capita than those subject to flat rates. The 2009 results show that the proportion of the population that pays for water through volumetric rates has been rising, indicating a move towards conservation-oriented water pricing in Canadian municipalities.

Identifying the appropriate price for water is not a simple task. To maintain a high quality of service, protect water resources and sufficiently fund water and wastewater infrastructure over the long term, it has been suggested that municipal water and wastewater utilities adopt full-cost accounting as an approach to setting water and sewer rates. Full-cost accounting implies taking into consideration not only the operations and maintenance costs associated with providing water and wastewater services, but also the opportunity costs of raw water withdrawn and the costs of any reduction in environmental quality that occurs from the utility operations (Renzetti, 2009).

Studies have shown that not only are most Canadian municipalities quite far from full-cost pricing (Renzetti, 2009), but also that Canadian water and sewer rates are significantly lower than rates in other OECD countries (OECD, 2004). We can therefore interpret the observed rise in average water and sewer rates as an indicator that Canadian municipalities are moving closer towards full-cost pricing, but that rates in many locations may need to increase to cover the full costs of water and wastewater services.

The next MWWS survey will collect data for the year 2011, continuing the series of Water Use and Pricing reports and data products produced by Environment Canada since the 1980s. These regularly produced data and analyses are intended to provide information that supports water management decisions in the broader context of ecosystem management, thus contributing to Canada's goal of promoting wise and efficient management and use of water.

Bibliography

Environment Canada. 2011a. 2006 Municipal Water and Wastewater Survey Pricing Summary Tables. Ottawa: Environment Canada.

Environment Canada. 2011b. Water in Canada. Online resource: www.ec.gc.ca/eau-water/default.asp?lang=en&n=5EA1D86E-1

Environment Canada. 2008. Municipal Water Pricing, 2004 Statistics. Ottawa: Environment Canada.

Environment Canada. 2005. 2001 Municipal Water Pricing (MUP) Summary Tables. Ottawa: Environment Canada.

Environment Canada. 2001. Municipal Water Pricing 1991–1999. Ottawa: Environment Canada.

Mirza, S. 2007. Danger Ahead: The Looming Collapse of Canada's Municipal Infrastructure (2007 FCM–McGill survey). Ottawa: Federation of Canadian Municipalities.

Organisation for Economic Co-operation and Development (OECD). 2004. Environmental Performance Review: Canada. Paris: OECD.

Pennachetti, J.P. and L. Di Gironimo. 2007. Water Rate Re-Structuring – Results of Public Consultation and Recommended Rate Structure. City of Toronto.
www.toronto.ca/finance/waterrates.htm

Renzetti, S. 2009. Wave of the Future: The Case for Smarter Water Policy. Toronto: C.D. Howe Institute.

Statistics Canada. 2006 Census of Population, Statistics Canada catalogue no. 97-554-XCB2006036. Ottawa: Statistics Canada.

Glossary

Base charge – See Box 1: Rate Types (p. 4)

Block rate (Increasing block rate/Decreasing block rate) – See Box 1: Rate Types (p. 4)

Constant unit charge – See Box 1: Rate Types (p. 4)

Flat/Fixed rate – See Box 1: Rate Types (p. 4)

Imputation – The process of estimating a missing value that a survey respondent failed to provide. The estimate can be imputed from the subject's responses to similar surveys in previous years, for example, or calculated using various statistical methods. In this case, missing values were imputed from data submitted in 2006 only, and where applicable, where adjusted for the change in the population in the intervening years.

Minimum charge – See Box 1: Rate Types (p. 4)

Municipality – A municipal-level jurisdiction (in an organizational sense and a spatial sense) as defined by Statistics Canada's Census Subdivisions. For the purpose of the Municipal Water Use and Pricing survey, municipalities may be grouped in some cases.

Population served – The portion of the responding population receiving a particular water-related municipal service (i.e., water distribution, water treatment, wastewater collection or wastewater treatment, depending on the question).

Proxy – A statistical variable that is similar enough to another to be used as a substitute for it, usually because it can be more readily measured than the original.

Responding municipality – A municipality for which there was a response to a given question in the 2009 survey. A municipality that fails to respond to a particular survey question can still be considered a responding municipality if its response can be imputed from other available information (see "Imputation" above).

Responding population – The number of people for which the responding municipality (see "Responding municipality" above) provided a response to a given survey question. For example, if a municipality provided the percentage of households metered for a water system serving 20 000 people and another water system serving 5 000 people, the total responding population for residential water metering for that municipality is 25 000 people.

Tax/Assessed charges – See Box 1: Rate Types (p. 4)

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