



CANADA'S **ECOFISCAL** COMMISSION
Practical solutions for growing prosperity

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Best practices for pricing
and improving municipal water
and wastewater services

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CANADA'S ECOFISCAL COMMISSION

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A group of independent, policy-minded Canadian economists working together to align Canada's economic and environmental aspirations. We believe this is both possible and critical for our country's continuing prosperity. Our Advisory Board comprises prominent Canadian leaders from across the political spectrum.

We represent different regions, philosophies, and perspectives from across the country. But on this we agree: ecofiscal solutions are essential to Canada's future.

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A thriving economy underpinned by clean air, land, and water for the benefit of all Canadians, now and in the future.

OUR MISSION

To identify and promote practical fiscal solutions for Canada that spark the innovation required for increased economic and environmental prosperity.

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What is the value of the services that provide clean water? We examine new Canadian policy solutions for water pollution, over-consumption, and infrastructure.

For more information about the Commission, visit **Ecofiscal.ca**



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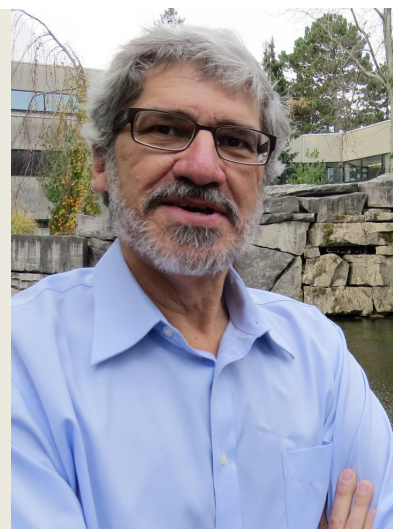
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DEDICATION

This report is dedicated in memory of Dr. Steven Renzetti, one of Canada's foremost environmental economists. Steven had a deep commitment to scholarly excellence and was an internationally renowned expert on water pricing and conservation. Through countless journal articles, books, and columns, Steven helped improve Canadian water policy in immeasurable ways. His research was grounded by an unwavering sense of humility and generosity; and despite his many commitments, he was ever approachable.

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EXECUTIVE SUMMARY

Picture a somewhat typical Canadian town. Its residents often visit the nearby lake to swim, boat, and fish. The lake also supplies drinking water to the local families and businesses. Fresh water seems plentiful, though hot and dry weather during the summer months has required the local council to limit watering lawns and washing cars. Further, beach closures and fishing restrictions seem to be a new normal for a few weeks each summer due to poor water quality.

The municipality is a growing and prosperous hub, a significant engine of economic activity in the region. Yet keeping up with growing infrastructure demands has been a challenge for the local government. Recent investments have helped, but a substantial infrastructure gap persists. Meanwhile, given the town's growing population and water use, upgrades to the aging wastewater treatment plant are required to keep the local lake clean and safe.

What might tie these threads together? Perhaps a surprising answer: user fees for water and wastewater services.

User fees make economic and environmental sense

User fees might sound technical and boring. Yet when we look deeper, the story of user fees for water and wastewater is important for thousands of Canadian municipalities. User fees can link engineered systems and natural freshwater assets with how we use and manage these assets in fiscally and environmentally sustainable ways.

Many Canadian municipalities have already taken significant steps toward better managing their water and wastewater services through user fees. Yet opportunities remain to go even further, particularly in jurisdictions still relying on other financing approaches.

This summary explains why user fees matter and provides our bottom-line guidance to policy-makers. For a deeper look at the engineering, economics, and policy details of user fees for water and wastewater services, including five comprehensive case studies, see the full report.

We take water and wastewater services for granted

Canadians value clean water. For many of us, water is a core part of our national identity, and we take great pride in Canada having one of the largest supplies of renewable fresh water on the planet. Most Canadians have access to world-class water services.

Despite our vast endowment of fresh water, many local ecosystems are becoming overdrawn or polluted—particularly in Canada's most densely populated areas. Contrary to popular belief, our water is becoming an increasingly scarce resource. And providing and maintaining clean water comes at a considerable cost.

The infrastructure that provides and treats our water has tremendous value. It underpins all the economic activity associated with cities and towns. These infrastructure assets are also closely linked to the value of our natural freshwater assets, such as lakes, rivers, and aquifers. When managed sustainably, water and

Executive Summary

wastewater systems can provide valuable services to our economy for future generations.

Yet we often take these assets—the sophisticated engineering systems as well as the natural freshwater assets—for granted. When we run the tap, flush the toilet, or buy goods and services supported by freshwater, how often do we consider the reservoirs, pipes, water-treatment plants, and natural ecosystems on which those actions depend?

The price we pay for water services doesn't reflect the full cost of providing them

Relative to other countries, Canadians pay very low prices for water and wastewater services. So perhaps it is unsurprising that we take our most precious natural resource for granted. With few exceptions, the price charged on our monthly or quarterly water bills does not reflect the true cost of providing the service, thus hiding its true value.

Charging less than the full cost of water and wastewater services has important implications for municipalities. First, it **poses risks to freshwater supplies**. We typically consume more water when it is cheaper (or unpriced), which contributes to wasteful consumption and water shortages. Consuming more water also results in more wastewater that requires expensive treatment. Overuse of the system means a heavier burden on both natural water assets and engineered infrastructure.

Charging less than the full cost has also contributed to **infrastructure gaps**. Some municipalities have old or insufficient infrastructure because their water revenues do not cover the full costs of the services. In turn, they lack the resources to build and maintain their systems. This can result in leaky or inefficient pipes, placing more stress on the overall system. Another possibility is inadequate water or wastewater treatment.

Infrastructure gaps also pose direct **risks for water quality**. With few exceptions, water needs to be treated before we can drink it, which often requires expensive, sophisticated technologies. If treatment infrastructure fails, it can result in illness or even death. Similarly, wastewater treatment plants minimize the risks associated with releasing harmful wastewater into surrounding watersheds. When under-treated, wastewater can pollute our waterways, leading to beach closures or illness.

Canadian municipalities have made significant progress on each of these challenges in recent years. And the relative importance of these challenges varies across different municipalities. Yet in all cases, ensuring that our water and wastewater systems are sustainably managed is a continuous process. This report draws on success stories in Canadian municipalities, while highlighting opportunities for further improvement.

Well-designed user fees can improve conservation, fund infrastructure, and protect water quality

When compared with other revenue tools, user fees are the best way to finance our water and wastewater systems. If designed well, they can align the price of using water services with the full cost of providing them. They generate revenue to fund essential infrastructure and even the protection of natural assets. They also create an incentive to use water more carefully, which reduces utilities' operating and capital costs.

User fees also have other benefits. Unlike other revenue tools, they can help water utilities become financially self-sufficient. This allows them to set prices that align with their core objectives and make more informed decisions about long-term capital and operational planning.

Well-designed user fees can ensure that clean water is affordable for low-income households

Although fees for water and wastewater services represent a very small portion of household budgets, concerns over the affordability of water—especially for low-income families—are important. Yet user fees can be designed to ensure that everyone has access to clean water. Municipalities can, for example, provide a basic allotment of water to all users or can provide targeted cash rebates to households. Such adjustments can improve fairness while achieving the other core objectives.

Municipalities can customize their approach based on their own context

Many Canadian municipalities face common challenges when it comes to the provision of water and wastewater services. At the same time, municipalities face local issues that are unique.

We describe 10 best practices for municipalities designing water and wastewater user fees. Many municipalities have already taken great strides toward implementing these best practices; others still have room to improve. While each best practice may not apply to each Canadian municipality, the overall collection provides a useful roadmap for improving performance across the country.

BEST PRACTICE #1

Installing water meters for all residential and commercial users

Water meters have proven benefits. Metering allows water utilities to measure water demand over time and across different users—households, businesses, and institutions. This information allows water utilities to quickly and more accurately identify leaks and improve efficiency, and it also helps with long-term planning.



Executive Summary

Water meters are also necessary for implementing volume-based (“volumetric”) user fees. Widespread metering for all households and businesses maximizes these benefits.

For example, Ottawa installed smart meters for all its households in 2011, which gives the city high-resolution data on the time and use of water. This allows the city to charge users in part based on their levels of water use, but also to quickly identify and fix leaks, and improve infrastructure planning.

BEST PRACTICE #2:

Estimating all private and social costs using a lifecycle approach

Before a municipality can develop a strategy to recover its full costs, it must understand the nature of these costs. This requires water utilities to develop a comprehensive asset-management plan. At a minimum, these plans should consider all the private costs (i.e., the costs borne by the water utility) associated with engineered infrastructure: operating, maintenance, and administration costs; research and development expenditures; existing and future capital costs; historical underinvestment; and outstanding debt obligations. When possible, asset-management plans should also consider social costs (i.e., the costs borne by society), such as the cost of protecting the natural assets that are the ultimate source of our water.

Unlike any other Canadian municipality, Gibsons, British Columbia, is pushing to include natural ecosystems within the valuation of its infrastructure. If formalized, the economic value of its pristine aquifer would be treated like any other asset with an estimable value. The costs of protecting its aquifer—or the costs of degrading it—would then be included within its cost-recovery framework. A significant obstacle to this practice exists, however: national accounting standards set by the Public Sector Accounting Board currently prevent municipalities from including natural assets in their audited financial statements.

BEST PRACTICE #3:

Estimating existing and future revenues from all sources

Asset management is only one half of developing a full-cost-recovery strategy. The other half is determining existing and likely future revenues. This requires looking at all sources of revenue, including user fees, development fees, fire-protection charges, property taxes, and government grants.

Forecasting revenues was a first step in the adjustments that the City of Ottawa made to its water and wastewater fees. Until recently, the city relied almost exclusively on volumetric fees, which, on one

hand, helped reduce consumption and improve system efficiencies. On the other hand, such a heavy reliance on volumetric user fees made revenues highly unpredictable due to gains in conservation and other changes in demand. This process helped identify a critical issue in terms of recovering costs.

BEST PRACTICE #4:

Identifying the funding gap and developing a full-cost-recovery strategy

With an asset-management plan in place and a comprehensive understanding of current and likely future revenues, municipalities can estimate their funding gap. Municipalities that have already made progress toward fully recovering their costs with user fees are likely to have smaller gaps. By contrast, the gap will be larger in communities with infrastructure investment backlogs or where future infrastructure costs are expected to increase dramatically.

Gibsons, British Columbia, recently completed 25-year and 100-year plans for maintaining and replacing its infrastructure. These plans informed a series of future rate increases.

BEST PRACTICE #5:

Relying on user fees to help close the funding gap

Of all the different financing instruments, user fees are the most flexible and practical revenue tool available to municipal water utilities. User fees can recover the full spectrum of private and social costs. If well designed, they can provide a clear price signal to encourage water conservation, especially when households and businesses have regular feedback on their consumption and can see how reducing their water use can save them money. User fees can also provide a stable and reliable revenue source, allowing municipalities to plan for the long term. Industry organizations, governments, and academics recommend and support this approach.

The City of Montréal highlights a significant opportunity for improvement: it is the only large Canadian city that does not charge user fees for its water and wastewater services. Despite major improvements over the past decade, such as upgrades to its aquaduct system, Montréal’s water and wastewater system is among the oldest in the country. Water meters are being installed on industrial, commercial, and institutional buildings; however, nearly all households remain unmetered, which is a clear obstacle to the introduction of volumetric user fees. Widespread metering and the adoption of user fees could help improve financial and environmental outcomes.

Executive Summary

BEST PRACTICE #6:

Using a multi-rate structure to achieve multiple objectives

A multi-part user fee is the best way to balance the objectives of encouraging water conservation and achieving full-cost recovery. The fixed portion allows utilities to recoup some of their fixed costs and provides stable and predictable revenues. The volumetric portion can recover variable costs and maintain a price signal to drive conservation.

The City of Ottawa recently shifted toward such a model in order to ensure it could recover costs. It uses a rate structure that combines volumetric and fixed pricing to both recover costs and encourage households and businesses to reduce their water use.

BEST PRACTICE #7:

Tailoring rates to the local context

Designing user fees to mesh with local context helps ensure that they are cost-effective and environmentally sustainable. Municipalities can tailor rates for different user classes based on water demand, location, required infrastructure, new developments, and type of use, ensuring that user fees more accurately reflect the costs that each type of user imposes on the system. They can also tailor rates to address local environmental pressures.

The District of Tofino, British Columbia, is prone to water shortages in summer—due to the natural weather cycle as well as the inflow of seasonal tourists. In response to historical shortages, it charges higher volumetric prices for water between April and September.

BEST PRACTICE #8:

Integrating relief for low-income water users

Ensuring water remains affordable, particularly for low-income households, is a key policy challenge. Two approaches can ensure that low-income households have affordable access to water:

- Municipalities can provide a basic allotment of water within the fixed portion of the user fee. Within this allotted amount, the cost to households for consuming one additional litre of water is zero.
- Municipalities can provide low-income households with assistance on their water bills. With this approach, all water users—regardless of income—pay the full amount of user fees upfront.

The Town of Battleford, Saskatchewan, employs the first approach. Each quarter, it includes a basic allotment of 30 cubic metres included within its fixed rate of \$135. Daily, this is approximately 330 litres per household at a cost of about \$1.50.

BEST PRACTICE #9:

Making adjustments over time—in a predictable and transparent way

User fees can be adjusted over time, as conditions change. The best rate structure today may not be the best structure in the future. Events such as higher-than-forecasted reductions in water demand or an economic downturn necessitate re-evaluating water rates to mesh with the changing context. As a best practice, water and wastewater rates should be reviewed annually and adjusted accordingly.

At the same time, a predictable and transparent process for adjusting the rate structure can help individuals and businesses plan over time. Sudden changes in rates can hinder planning but also create vocal opposition. Similarly, keeping the rate structure simple can make it easier for water users to understand and respond to the price signal.

After completing its comprehensive asset-management plan, the Town of Gibsons implemented a series of rate increases to close its funding gap. The goal is to fully close its funding gap by 2024, after which rate increases will be limited to the overall rate of inflation, approximately 2% annually.

BEST PRACTICE #10:

Complementing user fees with other tools, especially for small municipalities

Relying on user fees as the primary tool for improving the financial and environmental sustainability of municipal water and wastewater systems can help achieve economic and environmental objectives. Other tools, however, can be valuable complements to user fees.

For example, municipalities can provide better information to water users through more frequent bills or even real-time feedback on their use, facilitated by adopting advanced metering technology. The recent federal regulations for treating wastewater set mandatory minimum standards for effluent quality. Similarly, provincial regulations set minimum standards for how municipalities protect and treat drinking water. In some circumstances, grants from federal and provincial governments may have a useful role to play.

The City of St. John's, Newfoundland and Labrador, expects federal and provincial grants to finance a large share of its long-term capital plan. This highlights both the opportunities and the challenges of relying on other financing tools. The city is reeling from an economic downturn and may struggle to make upgrades in the absence of outside assistance. Over time, however, relying on grants can create barriers to increasing future user fees, as households may become accustomed to artificially low rates. This reliance limits the self-sufficiency and autonomy of the municipality and may also reduce incentives for conservation.



Executive Summary

Complementary policies may be particularly important for small municipalities, as they face several constraints that larger municipalities do not. Infrastructure in small municipalities is generally older and in greater need of repair. Smaller municipalities may have less financial capacity to make necessary infrastructure investments, or may lack the managerial and technical capacity required for integrated and robust long-term planning. In these cases, performance-based grants from federal and provincial governments can help small municipalities lay the groundwork for moving toward full-cost recovery through user fees.

Reliable and timely information is always needed for the development of sound economic and environmental policy. For the effective design of user fees for municipal water and wastewater services, detailed data on water use is essential. One current challenge for improvements in Canadian water policy is that a broad collection of water-related data, once gathered in a systematic manner by Environment and Climate Change Canada, has been discontinued.

Recommendations for a path forward for water and wastewater user fees in Canada

Drawing on these 10 best practices, we make six recommendations with the aim of improving the financial and environmental sustainability of our country's water and wastewater systems:

- 1** Municipalities should rely on multi-rate user fees to recover costs and encourage conservation.
- 2** All municipalities should develop an asset-management plan and full-cost-recovery strategy.
- 3** Municipalities should include natural assets within their asset-management and cost-recovery strategies.
- 4** The Public Sector Accounting Board should identify ways to broaden the financial framework to include natural assets.
- 5** Provincial and federal governments should encourage municipalities to adopt the best practices described in this report.
- 6** The federal government should reinstate the Municipal Water and Wastewater Survey.

Municipal user fees are one part of a much broader set of water policy issues

Municipal water and wastewater systems face significant challenges moving forward, and well-designed user fees are a key part of the solution.

But despite their importance, municipal water and wastewater systems comprise a small part of the entire water system. Also important are the issues that this report does not discuss, including the value of water as a resource, water access in First Nations communities, pollution from non-point sources, and other issues regarding water quality and quantity.

Tackling these issues goes far beyond the scope of municipal water systems. It requires rigorous, integrated, and multi-disciplinary research and a broader dialogue about how we manage and value water as a society. The Ecofiscal Commission will explore some of these issues in future reports.

To start this complex conversation, however, this report has focused on municipal user fees—one crucial tool for aligning water's price with its true value and helping us manage our most precious natural resource. Water and wastewater services might be largely hidden, but the price we pay for them should be in plain sight.