National Action Plan to Encourage Municipal Water Use Efficiency

Prepared by The CCME Water Use Efficiency Task Group

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Goal

The Canadian Council of Ministers of the Environment believes that improved water efficiency practices are essential to sustainable development. The goal of this action plan is to achieve more efficient use of water in Canadian municipalities in order to save money and energy, delay or reduce expansion of existing water and wastewater systems, and conserve water.

Background

Traditionally, municipal water management in Canada has focused on providing adequate supplies to meet municipal domestic and industrial demands. Increased demand has been met by adding to the water and wastewater delivery and treatment systems. However, the cost of expanding water delivery systems is rapidly escalating as more distant and expensive sources must be tapped. In addition, more stringent standards and regulations as well as increased use, have escalated the costs of improved water and wastewater treatment. Yet water pricing policies in most municipalities actually discourage efficient use of water. The price of water to consumers in many cases does not now reflect the true cost of treatment and delivery. We can no longer afford this approach.

Canadians use more water per capita that any other national population except the United States. Canadian water use is more than two times higher than that of Europeans. Canadians do not use water efficiently.

Currently, there is no consistent requirement for the use of water efficient fixtures in plumbing codes across the nation. Canada is behind other countries in providing consistent codes, guidelines, regulations and policies affecting water use efficiency.

Some municipalities have initiated programs encouraging water efficient practices, including promoting, or requiring, water efficient fixtures, such as shower heads and low volume toilets. They have demonstrated that significant savings can be achieved at little additional cost.

Water and wastewater quantity and quality are intertwined with social, economic and environmental concerns. Sustained quantity and quality of water preserves the environment, reduces energy consumption and preserves jobs.

The action plan offers direction to governments and recommends what government department and municipalities should do to achieve greater water efficiencies and decrease capital expansion and operating costs. In approving the action plan, the CCME recognizes that local conditions may affect how and when these recommendations might be implemented.

Approximately $600 million is spent annually by municipalities in Canada on expanding their water delivery and sewage treatment infrastructure. These costs can be sharply reduced, delayed or eliminated by applying water efficient technology that is already available.

Principles

Development of this action plan was based on the following fundamental principles:

Leadership. All levels of government – federal, provincial and territorial and municipal – must show leadership in advancing water use efficiency, building on existing knowledge and technologies.

Partnership. Environment ministers cannot achieve the goals of this plan alone. In order to succeed, this plan requires the participation of other government departments, municipalities, and all Canadians.

Harmonization. There shall be consistent regulatory requirements relating to water use efficiency across Canada.

User pays on basis of volume. Consumers shall pay for water and wastewater services on the basis of measured actual use.

Full cost pricing. Municipalities shall move towards water and wastewater rate structures that reflect the full costs of delivery and treatment.

An informed public. The public shall be informed of the real costs of water use and the savings that can be achieved through water efficiency, and of actions they can take to reduce usage.

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Expected outcomes

There are a variety of expected outcomes from this action plan, all of which are beneficial to governments and consumers. These are:

1. **Capital cost saving on the infrastructure to deliver water and treat wastewater**

Water efficiency has the potential to delay or eliminate the public funding required for additional facilities needed to meet future demand for water and wastewater treatment, by reducing the demand. It also will reduce the cost of collecting and treating wastewater as flows are subsequently reduced (over and above reductions in inflow and infiltration).

2. **Environmental quality improvements**
   Increased water use efficiency reduces the volume of water used by consumers, and of wastewater going to treatment facilities.
3. **Energy conservation**
   Water efficiency also means being more efficient with the use of energy. Less energy is used to heat water, and to pump potable water and wastewater.
4. **Urban intensification**
   Water efficiency allows more intensive development on existing water and sewer infrastructure, as less water is required per household or business. Water conserved is generally cheaper than water provided through building a new water plant.
5. **Development opportunities, increased competitiveness and job creation**
   The move to water efficiency will trigger new economic activities for water-related manufacturing and service sectors, encouraging new business opportunities and job creation. Increased efficiency also means lower costs to business, leading to increased competitiveness.
6. **Water conservation**
   Reduced water use helps to preserve and protect surface waters for fish and wildlife habitat and our natural attractions. These are essential to the economic health of Canada's tourism and outdoor recreation industries.

The City of Winnipeg estimates that a 5% decrease in per capita water use by 1996 will defer the construction for 13 years of supplementary municipal supply facilities estimated to cost up to $350 million.

The town of Elmira, Ontario, estimates that replacement of all toilets with ultra-low flow devices would result in a 30% flow reduction, and defer construction of a $33.5 million sewage treatment plant until 1999, thereby saving up to $9.3 million over the 5-year period.

The town of Port Elgin, Ontario (pop. 6500), avoided a $5.5 million expansion of its water treatment plant by installing 2400 residential water meters in 1991 and through an intensive water conservation program, for a cost of $550 000. This reduced the summer water use by 50%, and use for all of 1993 by 25%, and dropped the waste water flow by 30%. The town also saved $12 000 in water and sewage treatment operating costs (chemicals and energy).

In a 1992 pilot program, the Regional Municipality of Waterloo and the City of Kitchener, Ontario showed that households with ultra-low flow (ULF) toilets saw water use fall between 20 and 30%. The annual saving for home with ULF toilets was between $65 and $135. Leakage was discovered in approximately 10% of homes, comprising over 10% of household water consumption.

Plan elements

1. Government leadership

- ***Governments shall demonstrate leadership by reducing water use in their own facilities as well as in new publicly-funded facilities.***

    - Environment ministers, working with other government departments, will develop water efficiency strategies for government facilities, reviewing water use and evaluating where to get the most cost effective savings.
    - Ministers will initiate retrofits to government facilities where cost-effective, targeted at the most inefficient uses.
    - Ministers will organize demonstration projects with high public visibility showcasing economic benefits of water use efficiency measures and benefits.
    - Ministers will initiate action to share information, efficiency models and prescriptions to avoid redundant research and implementation delays.
    - Ministers will act to implement water efficient specifications for new government-owned and funded facilities and public housing by January 1, 1995.

Examples of Water and Cost Savings from Audits on Federal Buildings

Facility	Annual water (m3/y)		Cost savings due to retrofit ($)	Retrofit cost ($)	Payback period (months)
	pre-retrofit	post-retrofit			
Health Canada - Banting Bldg.	84 553	78 735*	7 971	10 000	15
Dept. of Nat. Def. (HQ) - Pearkes Bldg.	165 402	86 000	62 000†	190 000	37
Correctional Serv. - Warkworth Institution	320 500	280 200	14 000	16 500	14

* Average annual water use based on FY 91/92, 92/93 and 93/94 meter records.
† This is the net saving after subtracting the $46 800 cost of chilled water for air-conditioning from the overall water saving of $108 800.

- ***Governments shall adopt consistent policies, regulations and codes concerning water efficiency.***

    1. Environment ministers shall work with appropriate ministers to amend plumbing codes to be consistent with water efficiency provisions elsewhere in North America.
    2. Ministers shall encourage development of a water fixture efficiency labelling regulation, equivalent to the current labelling regulation for energy-using appliances.
    3. Environment ministers, in cooperation with other appropriate ministries, will review provincial programs, policies, regulations and codes, to identify and remove impediments to water efficiency.

For example, Ontario's revised plumbing code requires that new water fixtures have the following capacities:

Effective January 1, 1993
Faucets shall use 8.4 litres/minute or less

Showerheads shall use 9.8 litres/minute or less *Effective August 1, 1993* Toilets shall use 13.2 litres/flush or less *Effective January 1, 1996* Toilets shall use 6 litres/flush or less

- ***Governments shall ensure full public awareness and understanding of the economic, and social and environmental benefits of more efficient use of water.***

    1. CCME shall coordinate development of a generic public education and awareness strategy on water use efficiency.
    2. Environment departments in each jurisdiction shall develop and implement their own public education programs on water efficiency.
    3. Environment departments will promote public events and conferences in support of water use efficiency.
- ***Governments shall encourage and foster the acceptance and use of existing water efficient products and the development of new water efficient products.***

    1. Ministers shall consider reallocating funds for research and development relating to water use efficiency.
    2. Ministers will encourage development and promotion of Canadian-made water efficient products and technologies for domestic and international markets.
    3. Appropriate departments will organize and exploit opportunities to showcase and market Canadian water efficient products and technologies.

2. Encouraging municipal water efficiency

- ***Provincial, federal and territorial governments shall assist municipal actions which increase water efficiency at the municipal level.***

    1. Governments shall integrate municipal water use efficiency criteria into infrastructure assistance programs.
    2. Governments shall incorporate water efficiency initiatives in their policy and regulatory structures.
    3. Governments shall develop a generic water efficiency plan outline to be available for use by municipalities as a guide for developing their own plans.
    4. Governments shall promote the following actions to be taken at municipal levels:
        - Identifying and reducing unaccounted for water through system audits and leakage control programs.
        - Introducing mandatory metering on all new construction, and moving towards universal metering.
        - Initiating public, stakeholder and school information and education programs in support of water efficiency.
        - Undertaking audit and retrofit programs for commercial, industrial, institutional and residential facilities.
        - Moving towards full cost pricing.

- Charging users on the basis of the water they use and the wastewater they generate.
- Reviewing administrative arrangements for achieving efficiencies in managing water delivery and sewage treatment systems.
- Using utility bills to show consumers actual charges for the various components of their water delivery system, how charges are determined and savings that would be achieved with water efficient devices.

- A leak detection/correction program is Sillery, Quebec in 1977 uncovered daily losses of 3.8 million litres of treated potable water – 35% of their treatment plant's total production.
- Calgary initiated a leak detection and repair program in 1980. Since then, watermain leakage has been reduced from 30% of annual production to 12%, and the average daily per capita comsumption has decreased by a third. It was estimated that the program has saved $4.1 million in operating costs.

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Implementation

Upon approval of this action plan by CCME, an implementation phase can begin. An initial action will be to establish a multistakeholder task group that would coordinate and guide the implementation of this action plan. The task group will be required to track the progress being made, and will report to CCME at regular intervals.

It is recognized that implementing this plan will occur at different rates across the country, and that flexibility in approach can be expected. Within this general context, the following tables outline specific recommendations for implementation, with suggested lead agents and timing for each:

Detailed implementation plan

1. Demonstrate Leadership

Action	Steps	Lead	Timing
Demonstrate water efficiency in selected government buildings	• Select buildings • Conduct audits • Retrofit • Monitor and showcase	Environment Depts. Legislative Buildings	Begin immediately
Develop strategies with other departments for all government buildings	• Establish link with "landlord" agency • Develop a schedule for water use review and cost savings assessment • Develop water efficiency plan for building	Environment Depts. "Landlord" agencies	Fall 1995

1. Demonstrate Leadership

Action	Steps	Lead	Timing
Retrofit where cost effective	• Establish program for retrofitting across government • Start with faucet aerators; move to toilets/showers	Environment Depts. "Landlord" agency	Immediate Complete in 2 years
Share information	• Compile inventory of existing technical information	Environment Canada Ontario MOEE	Summer 1994
	• Establish electronic bulletin board	Environment Canada	Fall 1994
Implement water efficiency in government-funded facilities	• Compile necessary specifications	CCME	Fall 1994
	• Implement	Governments	Winter 1995

2. Adopt consistent policies

Action	Steps	Lead	Timing
Amend plumbing codes (include labelling of plumbing fixtures)	• Identify department responsible for plumbing code	Env. ministers	Immediate
	• Review of proposed model code	All government stakeholders	Sept. 1, 1994
	• Draft new provincial code	Department responsible	Oct. 1, 1994
	• Publicize and consult	Department responsible	Jan. 1, 1995
	• Code to legislative committee	Department responsible	Mar. 1, 1995
	• Proclaim code for use January 1996	Department responsible	Apr. 1, 1995
Water efficiency labelling regulations (for appliances)	• Form CCME Technical Committee	Ontario MOEE	Summer 1994
	• Committee and appliance manufacturers meet	Committee	Sept. 1994
	• Committee recommends	Committee	Jan 1995

2. Adopt consistent policies

Action	Steps	Lead	Timing
	necessary regulations		
Remove barriers to water use efficiency	• Form multi-stakeholder group/tie in with existing committees	CCME	June 1994
	• Review of high priority regulations	Multi-stakeholder group	June 1994
	• Develop list of preferred legislation (e.g., grey water, cisterns)	Multi-stakeholder group	June 1994
	• Provincial review/removal of impediments	Identified departments	June 1995
	• Code amendments	Governments	Jan.-June 1995
	• Consultation with stakeholders	Governments	Jan.-June 1995
	• Effect changes	Governments	Jan. 1, 1996

3. Public education and awareness

Action	Steps	Lead	Timing
Coordinate development of generic public education and awareness strategy	• Identify key messages, target audiences and media/materials • Identify key partners	CCME communications/ education specialists	Oct. 1994
Environment Departments draft water efficiency public education programs	• Develop plan	Environment education and communcations specialists	March 1995
	• Adopt/use generic materials		
	• Implement plan		
	• Report progress		May 1995
Organize events and conferences	• Explain/present action plans	CCME and other organizations	May-June 1994, after adoption by Council early

3. Public education and awareness

Action	Steps	Lead	Timing
			1996
	• Second National Water Efficiency Conference	CCME	Early 1996
Make water efficiency part of 1995 Environment Week		Environment Canada	June 1995

4. Research and development and technology transfer

Action	Steps	Lead	Timing
Priority funding for water efficiency R&D	• Prepare briefing document on R&D needs	Environment Canada	Dec. 1994
	• Circulate document to researchers, research-funding agencies, and manufacturing associations	Environment Canada	Feb. 1995
Promote development of water efficiency products and technologies for domestic and international markets	• Establish grants to encourage manufacturers and investors, in cooperation with CEIA	Applicable Fed./Prov. agencies	Apr. 1995
	• Grants to municipalities for field testing new technologies	Applicable Fed./Prov. agencies	Apr. 1995
Sponsor and encourage trade shows to showcase Canadian water efficient products and technologies	• Industry could, and Environment Canada shall, lead all appropriate initiatives in support of existing national and regional exhibits	Environment Canada	
	• Second national water efficiency conference	CCME	Early 1996
	• Committee to assess dissemination of ideas	CCME/liaise with CEIA	Informal/ as needed

5. Encouraging municipal actions

Action	Steps	Lead	Timing
Integrate water efficiency criteria into infrastructure assistance	• Develop criteria	CCME and partners	Jan. 1995
	• Assess	CCME and	June 1995

5. Encouraging municipal actions

Action	Steps	Lead	Timing
programs, including incentives for water efficiency planning	implementation means and recommend	partners	
Incorporate water efficiency initiatives into government policy and regulatory structures	• Require water efficiency in new government construction	Governments	Jan. 1995
	• Harmonize codes	Governments	
	• Adjust assistance programs	Governments	
Develop a generic water efficiency plan outline as a guide for municipalities	• Examine existing plans and processes • Compile elements into an outline	FCM, CWWA, in cooperation with CCME	Jan. 1995
Develop municipal water efficiency plans	• Identify and reduce water losses and infiltration into sewers	Municipalities	Begin formation of basic plans immediately*
	• Undertake public, stakeholder and school education programs	Municipalities	
	• Undertake audits, fixture and fittings replacements and retrofits for residential, commercial, industrial and institutional users	Municipalities	
	• Move to full cost pricing	Municipalities	*Many municipalities have water efficiency plans/ programs already in place. The incentive for others to undertake water efficiency programs will
	• Implement user pay principle based on volume used and wastewater	Municipalities	

5. Encouraging municipal actions

Action	Steps	Lead	Timing
	produced		be through the government steps noted above.
	• Review administrative arrangements	Municipalities	
	• Modify billing procedures to identify water use	Municipalities/ Utilities	

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