

# Water is Liquid Electricity

## FOR THE LOVE OF CONSERVATION

by Peter Love



Water availability and quality are emerging as huge global issues, which may well become a tangible crisis before even climate change reaches that point. You can expect to hear more and more about this as it begins to compete with climate change as the leading environmental issue of this century.

While Canada, including Ontario, is extremely fortunate to have among the largest sources of fresh water in the world, we are not managing this resource very well.



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As noted in the recently released Living City Report Card, the Greater Toronto area’s management of its water resources rated a C for water quality, a C for water quantity flood management, an F water quantity storm water management, and a C for water conservation. And then, of course, there was the wake-up call of the seven Walkerton, Ont., deaths in 2000.

But in addition to these concerns about water availability and quality, there is another very important reason why everyone, and in particular, the leaders in the development of green buildings

might want to pay more attention to water: it’s ENERGY. It is a huge surprise to everyone – except the very few who are in the water business – that the treatment, pumping, distribution, and waste-water treatment in our cities are huge consumers of electricity.

A recent report entitled Ontario’s Water-Energy Nexus by POLIS Water Sustainability Project estimated that treating and transporting clean drinking water requires the same amount of electricity that is needed to light every house in the province! And if the energy required to heat water in homes and generate steam for manufacturing and space heating is included, water-related services consume about 40 per cent of the natural gas and 12 per cent of the electricity for the entire province. At the household level, it has been estimated that running your faucet for five minutes uses up enough energy to run a 60-watt light bulb for 14 hours.

For municipalities like the City of Toronto, Toronto Water consumes by far the most electricity of all the city’s 13 divisions, representing almost 35% of the total. It even consumes more than any of the City’s agencies, boards and commissions; these include the Toronto Transit Commission and Toronto Community Housing Corporation. In the City of Guelph, which relies on pumped ground water for all its requirements, electricity consumption represents almost 50 per cent of total electricity requirements.

The solution bears resemblance to the famous three Rs – reduce, reuse, and recycle. As with solid waste, energy, and every other environmental problem, the first step, which is the easiest, least expensive, and quickest way to reduce the energy and other environmental costs associated with water treatment and transportation, is to reduce overall water consumption. In homes, offices, and schools, this means low-flush toilets, efficient low-flow water faucets, shorter showers, not leaving taps running, repairing leaky

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faucets/toilets, reduced watering of lawns, etc. In industry terms, it means using processes that waste less water. For municipalities, it means reducing the huge amount of water that is wasted through leaky distribution systems, which waste 10 to 30 per cent, according to Environment Canada.

The second step is to reuse water more than once. Again for homes, offices, and schools, this includes using “grey” water for some applications, like flushing toilets, where crystal-clean water is not required. Ideal sources for grey water include baths, showers, and washing machines. Another residential application is using rainwater for toilets or watering lawns/gardens. Guelph’s rainwater harvesting rebate program is an excellent example of this approach. Another novel approach to reusing the energy contained in hot waste water from showers, baths, washing machines, etc., is a Canadian invention called the Drain Water Heat Recovery System. Some industries almost mastered this procedure, using water multiple times at different stages in the manufacturing process.

As with energy conservation, some water-conservation approaches can be implemented for very little or no cost (taking shorter showers, reducing lawn watering, installing low-flow faucets and disconnect down spouts) but others (grey water reuse systems, Drain Water Recovery Systems, and especially repairing leaking distribution systems) require capital investment. In this economy, when homeowners, as well as businesses and governments, are strapped for money, where can this come from? One source would be consumers, via a small charge on the consumption of each litre of water. This would be similar to the conservation funding raised through regulated rates approved by the Ontario Energy Board by Ontario’s natural gas distribution companies for the last 15 years. To date, these funds have earned Enbridge custom-

ers a net energy savings of \$1.3 billion. More recently, Ontario’s electricity utilities and the Ontario Power Authority are now investing about \$400 million in a range of conservation programs, with funds from everyone’s electricity bills. Ontario’s new Water Opportunities Act provides a potential vehicle for the collection of funds from water-consumers that could be used to fund, at least partially, some of these water-conservation initiatives.

I encourage all the leaders in the green building movement to look into the many untapped opportunities to conserve water in the new homes you design and build and be part of the solution to this critical environmental issue. And, support the introduction of a water-use fee to fund water-conservation initiatives.

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