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BUILDING A BETTER WORLD

Quenching Water's Thirst for Value

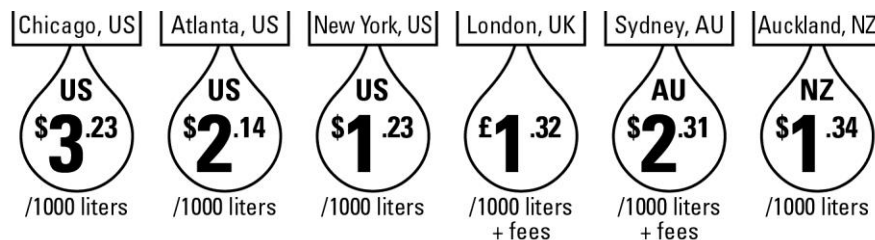
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Quenching Water's Thirst for Value

By Alan J. Krause, Chairman and CEO, MWH Global

Samuel Taylor Coleridge wrote the poem “The Rime of the Ancient Mariner” about a sailor on the ocean who, though completely parched and surrounded by water, cannot drink a single drop. It is a metaphor that is frighteningly relevant when examining our earth’s resources today. Although 75 percent of the earth’s surface is covered by water, less than three percent of it is fresh water, and only one percent of the world’s fresh surface water is readily accessible for direct human use.¹ And yet, water is not valued like other commodities globally. Natural resources, such as oil and gas rely on the economic models of supply and demand. At the time of this writing, oil is valued around \$100 per barrel, while water is sold at fractions of that cost in major cities around the world. Figure 1 compares water rates in some of those cities.^{2,3,4}



Source: *Infrastructure* magazine, New York City Water Board, Prairie Research Institute

Figure 1

Although the world’s economies are improving at different rates, there is a lack of funding to support new and aging water infrastructure. This lack of funding is due to the recession, but is also a result of the low value placed on water by the general public. Even in the best of economies, market forces of supply and demand do not prevail for infrastructure. This is an international problem, and it is clearly an area that we recognize as an integral part of civilization and growth for a community. And, because the price of water has been low historically, it is difficult to gain support for price increases to recover the full cost of water.

¹ National Geographic. “Freshwater Crisis”. <http://environment.nationalgeographic.com/environment/freshwater/freshwater-crisis/>.

¹ Financial Times. “A World Without Water”. <http://www.ft.com/intl/cms/s/2/8e42bdc8-0838-11e4-9afc-00144feab7de.html#slide0>.

² Cantrell, Clint. *Infrastructure*. May 2014.

³ New York City Water Board. Rate Schedule. July 2014.

⁴ Prairie Research Institute. Illinois State Water Survey. <http://www.isws.illinois.edu/wsp/faq/wsmore.asp?id=q4>.

Perhaps this is why we don't value our water infrastructure systems enough to invest in them. Oddly enough, we are willing to pay a high price for bottled water and other drinks that are water-based. One MWH engineer calculated that the cost of one liter of bottled water is nearly 1,750 times more expensive than water delivered to individual residences through public systems, and this does not include the cost or time spent to purchase bottled water.⁵ In the United States,

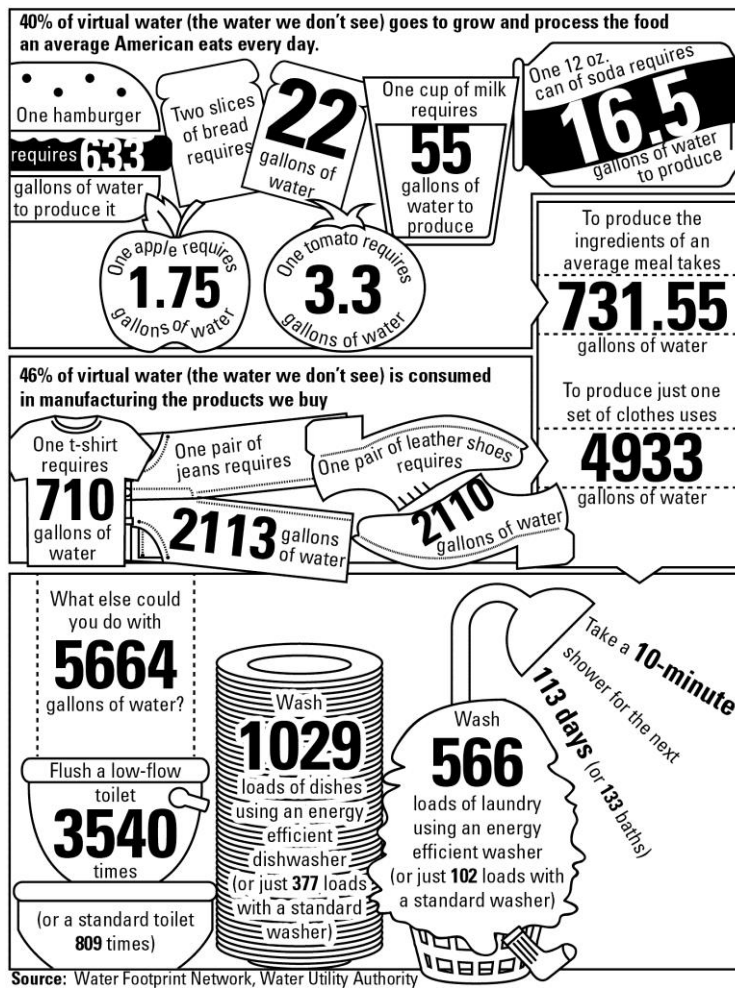


Figure 2

produce an average American meal, and it takes nearly 5,000 gallons of water to produce one set of clothes as simple as jeans, a t-shirt and shoes.⁸ [Figure 2]

Americans buy an estimated 42.6 billion single-serving (1 liter or less) plastic water bottles each year. People in Western Europe consume almost half of all bottled water produced, amounting to more than 100 liters per person each year.⁶ Using the current cost of bottled water, the average person spends \$242 per year on bottled water. The total cost of monthly water bills would be \$60,000 if tap water were the same price as bottled water.⁷ It is interesting that we buy bottles of water at a high rate for convenience--not necessity--while we won't prioritize what needs to be done to facilitate sustainable water systems. In addition, generally, most Americans are not aware of the invisible cost of water, or costs that are required to grow and process food and other

household goods. It is estimated that it takes 732 gallons of water to

⁵ Cantrell, Clint. *Infrastructure*. May 2014.

⁶ Raj, T.V. Antony. "Price of Bottled Potable Water Around the World." <http://tvaraj.com/2013/11/11/price-of-bottled-potable-water-around-the-world/>. November 11, 2013.

⁷ Statistic Brain. "Bottled Water Statistics". <http://www.statisticbrain.com/bottled-water-statistics/>. January 2, 2014.

⁸ Water Footprint Network, Water Utility Authority. Combined calculation from statistics.

How did we get here? Historians trace sophisticated water and sewerage systems back to ancient times. But the modern water systems date back to the 1800s in the United Kingdom. This is the same time that MWH was founded, and we are proud of our heritage which dates back two centuries. But we are concerned that if the general public does not act as good stewards and global citizens, the next two hundred years will be more challenging.

It is important that everyone understands and respects the value of water and opportunity to invest in its future. While the solutions are different everywhere, there is one overarching opportunity, and that is education. We must help the general public learn the value of water to ensure people will pay a proper amount to receive it and, in turn, support the infrastructure needs to allow for sustainable systems.

Value of water education is the umbrella over which all water infrastructure repair and replacement options should fall. It is a long journey of education, but will provide the full benefits of the importance in investing in water infrastructure. We must make water a business proposition, not an emotional one, and we cannot proceed without the full engagement of every stakeholder across the water delivery model. Regardless of whether we represent professional associations, water utilities, companies in the private sector supply chain, businesses or residential communities, we all have a crucial part in changing the perception about water's value.

There are four key areas of focus:

In Deep Water: In North America, each day, it is estimated that there are 850 water main breaks resulting in a total annual repair cost of \$3 billion.⁹ Systems have aged to failure, and municipalities cannot make the needed investments to support the cost of infrastructure fixes. Policy makers and elected officials have a tendency to focus on other areas that will have a payback during their terms. In some cases, the problem is just too large, it's too much work, or the benefit is too far into the future. As a result, utilities and municipalities will be forced to repair infrastructure as it breaks, rather than improve it as it is needed. This is a much more expensive option.

These challenges do not exist just in North America. Across the globe more progressive cities and corporations are taking a different approach by developing specialized asset management programs. These programs tailor investment needs with financial realities. Rather than focusing on the entire utility system, which can be costly and overwhelming with little early returns on investment, cities are strengthening each asset base individually and ultimately strengthening the whole system. For example, it is common for cities to invest money in water main breaks,

⁹ Watermain Break Clock.Com. <http://www.watermainbreakclock.com/>.



but what about proactively investing in water meters? Cities are stretching their water meters to their full life potential, believing they are saving money on replacement costs; however, over time, the meters begin to provide less accurate readings. This, ultimately, impacts their revenue stream. By implementing a progressive asset management program to understand the meter readings and recalibrate the meters to avoid losing revenue, cities are fully realizing the value of water consumed. This is just one example of how cities and municipalities can avoid falling into the “deep water.”

Keeping Your Head above Water: In the 20th century, the world’s population tripled, and the use of renewable water resources has grown six-fold.¹⁰ Every water utility and municipality should be considering water reuse programs, water recycling processes, water regeneration systems and eco-system development.

In 2013, the City of Anaheim, California began operating its new innovative and award-winning water recycling program, demonstrating how urban developers can use low-impact development features in any location. The first-of-its-kind recycling center is capable of processing 100,000 gallons of water per day from raw sewage into water used for irrigation and toilet flushing in nearby commercial buildings. Located just 20 feet from Anaheim City Hall, the treatment facility expels neither noise nor odor.¹¹

The project has been recognized as an Engineering Achievement of the Year by the State of California from the California Water Environmental Association, and it has been honored with an ‘Award of Merit’ by *Engineering News-Record California* as part of the Best Projects 2013 competition in the water/environment category.

It serves as an excellent example for what cities can be doing to proactively explore water supply opportunities, educate the public about the value of water, and keep their “heads above water.”

Test the Waters: Ratepayers are generally more open to changes when they understand why their rates are changing. If the municipality or utility can be specific about costs and identification of exactly what needs to be upgraded while introducing a realistic plan to update the water infrastructure, they will have a better opportunity to raise rates. The challenge with this scenario is its political viability and commitment.

¹⁰ World Water Council. Water Crisis. <http://www.worldwatercouncil.org/library/archives/water-crisis/>.

¹¹ MWH. “Anaheim Water Recycling Demonstration Facility”. <http://www.mwhglobal.com/mwh-projects/anaheim-water-recycling-demonstration-facility>.



The City of Santa Fe, New Mexico successfully created a community effort surrounding the true cost of water. Following an acquisition of its water system from Public Service Company of New Mexico, the city realized its revenues were not sufficient to meet the requirements of the bonds issued to finance the acquisition. Meeting the demands of the bondholders required an immediate and drastic rate increase. Vowing to never let such a situation happen again, the city created a long-range financial plan with detailed projections of water demands, rates, operating and capital costs. The city was able to finance its major water supply acquisition and maintain six successive years of eight percent rate increases. Cash reserves remain strong and the City of Santa Fe is able to fund millions of dollars of capital construction each year from its annual earnings without issuing any new debt.¹² This is an example of how cities and municipalities can “test the waters” with their customers and rate payers and develop buy-in for long-term financial and serviceability goals.

Singing in the Rain: Involving private investors in infrastructure development has been an innovative way to support infrastructure funding gaps in non-water commodities. In this scenario, municipalities must identify the potential issues, develop a plan, and seek alternative financing and solutions from the private sector. By utilizing these public-private partnerships (PPPs) utilities can leverage the assets and capabilities of the private sector to make needed improvements.

The City of Fillmore, California recently completed a new recycled water scheme by proceeding with a PPP to enhance the antiquated wastewater treatment facilities that had been in place for decades. By implementing this approach, private capital and resources were utilized to build and operate new facilities. It’s difficult to promise a one-size-fits-all solution that allows every utility to be “singing in the rain,” but PPPs can offer distinct advantages for certain situations such as this one.

Ultimately, given where we are today, until organizations can change the public perception of the value of water, infrastructure will operate to failure. This means that more patches and repairs will be needed and more people will be inconvenienced. Also, the ultimate investment will be much more expensive. However, the optimistic side of me believes that with education and collaboration from many parties, we will be able to increase awareness of this issue. We need to be able to identify opportunities to fix, maintain and build systems to manage growing needs through public and private funding so that we will not be surrounded by water without “any drop to drink.”

¹² MWH. “New Mexico City Water Division Financial Strategy Development”. <http://www.mwhglobal.com/mwh-projects/financial-strategy-development>.

