

## *News & Views You Can Use*

### **Our Aging Infrastructure**

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**Water shortages, failing infrastructure, broke governments, a crumbling municipal bond market and the need for high subsidies. While the global pump community tools up to participate in the business of water, the question remains: From where will the funding come?**

In the time it takes to read this sentence, a significant water line will rupture somewhere in the U.S. That is because, according to the Environmental Protection Agency (EPA), somewhere in the U.S., a water line ruptures every two seconds. In Washington D.C. alone, a pipe break occurs every day.

The water main breaks in the U.S. are not ordinary faucet drips. While we have all seen water line ruptures that have caused wet streets and small sink holes, increasingly, areas are experiencing the kind of water main breaks that require evacuation and rescue via boats and helicopters.

The U.S. Geological Survey estimates that the annual water lost from distribution systems is 1.7 trillion gallons, at a national cost of \$2.6 billion per year. That is the drinking water side. There are also 75,000 sanitary sewer overflows each year in the U.S., resulting in the discharge of 3 to 10 billion gallons of untreated wastewater. This can certainly all be expected from a water infrastructure that has been evaluated and graded a D-minus.

Approximately 1 million miles of water lines and 800,000 miles of buried wastewater (sewer) lines are located in the U.S. Underground infrastructure was mostly developed during three main time periods due to population growth and movement in the late 1800s, pre-WWI and post WWII eras. Pipes constructed in each of these time periods will begin to fail over the next couple decades due to age, materials used, inadequate design, poor installation and soil and water content. Pipes have life cycles that can range from 15 to more than 100 years depending on material and environmental factors.

The piping issue alone is staggering. However, many additional components make up water systems—including fire hydrants, valves, tanks, pumps, motors, mixers, filters, sensors, meters and vaults. While static components, such as piping, are susceptible to ground movement, freezing, thawing, corrosion, tree roots, etc., rotating equipment longevity is susceptible to many of the same influences in addition to wear and technological obsolescence.

The World Economic Forum Global Risks Report for 2010 highlights the fact that under investment in the world's critical infrastructure is one of the biggest global threats. Global infrastructure investment needs will be a staggering \$35 trillion over the next 20 years. According to The World Bank, in the U.S. about \$2.2 trillion will be needed over the next five years to address the problem.

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## The Price of Water

Consider for a moment the 2009 figures for the average water use for a family of four in the U.S.:

- Average monthly water consumption: 18,000 gallons (24 hundred cubic feet HCF)
- Average cost per HCF: \$1.50
- Average monthly water bill: \$36
- Average monthly sewer bill: \$15
- Total average monthly water bill: \$51

These figures are based on services from small municipalities. Many larger municipalities have tiered water rate structures with increasing prices based on usage past a standard family consumption expectation. Ideally, municipalities would prefer to fund their operating budgets and capital expenditure needs through revenue receipts. However, the average homeowner regards water as a right as opposed to a resource that requires significant investment before it arrives clean and safe from the tap.

While in some of the more arid areas of the U.S., water pricing is creeping up in an attempt to narrow the gap between revenue and spending, many municipalities simply do not generate enough revenue from the billing of drinking water use or the processing of waste to cover operating costs, equipment upgrades, expansions or catastrophic failures. Most people still believe that water is plentiful and inexpensive and do not give a second thought to the fact that the water in our toilets is as clean and drinkable as that coming from our faucets.

When the topic of infrastructure spending comes up in many town halls, residents consider a price hike in water as absurd if not insulting because, for most of our lifetimes, water has been provided plentifully and inexpensively. Tangible problems such as street repairs, new rail systems, and new parks translate to successful urban planning and development. It is, therefore, no wonder that people become surprised when water infrastructure fails and a home is swallowed in a sink hole. The money for preventative maintenance rarely hits municipal budgets.

Water pricing is largely determined by these factors: demand, cost of transport from the source, amount of treatment required and the amount of available subsidy. On average, 40 percent of municipal suppliers do not charge enough for water to meet their basic operation and maintenance costs.

## Funding Infrastructure

Clearly, if infrastructure could be repaired and leak rates minimized, additional savings could be realized that would afford many municipalities the opportunity to become more self sustainable. However, significant investment must be made just to arrive at a point that this can occur.

For many years, the low price consumers pay for water has been subsidized through municipal bonds, which on average make up 60 percent of a municipality's financing needs, with earnings accounting for 20 to 30 percent of the difference followed by grants and other loans. However, this funding source is now severely challenged. Standard & Poor's, in a report released on July 21, 2011, indicated that a downgrade of the U.S. credit could severely disrupt the municipal capital markets, making it more of a challenge for some public issuers to receive financing.

Another source of funding is the privatization of water works. By contrast, privatized water works must derive as much of their revenue as they can from earnings, which on average with private firms is only 40 to 50 percent. The rest is made up through stocks and taxable bonds, industrial revenue bonds and other sources. Proponents of privatization argue that this avenue is needed to bring more private money into infrastructure needs, whereas opponents of privatization argue that, inevitably, privately owned water works must raise prices to make the venture attractive and viable.

In 2007, U.S. Senators Christopher Dodd and Chuck Hagel proposed a National Infrastructure Bank. However, this initiative is also one of substantial leverage and would rely heavily on an already overburdened global debt market.

Increasingly, many believe the answer to the problem of funding water infrastructure can be found simply in the price paid for water. The American Water Works Association, one of the foremost voices in the water industry, has committed as an organization to the principle belief that utilities should be self-sustaining through their rates. A true landed cost analysis of water, when infrastructure needs are taken into consideration, would reveal a price point well above the current national average.

### **Where Does This Leave the Pump Industry?**

The failing infrastructure must be addressed, and significant spending will inevitably occur. However, we can expect the business environment to change. The price of water will likely continue to increase, and with that, engineers will look to suppliers who can deliver efficiency, energy savings and sustainable equipment that is reliably leak free. Privatization will continue to expand and traditional equipment suppliers will not only manufacture and supply equipment but will also own and operate the water plants.

The pump industry will also evolve into suppliers offering more holistic solutions to the water infrastructure issue and not just a mechanical means of moving the water through the pipes. As traditional pump companies continue to tool up for the gathering storm of infrastructure needs, we will see some companies completely change in corporate identity as they become experts in pumping water, and treating, filtering, cleaning and reusing it.

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