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“When the well is dry, we know the worth of water.”

- Benjamin Franklin, 1746

THE BUSINESS OF WATER: A NEW AGE OF INVESTMENT TRENDS AND TECHNOLOGIES

The issues presented by climate change in tandem with the challenges of an expanding global population are introducing significant disruptions to the full spectrum of developed and emerging nations. Radical yet slow moving shifts are manifesting most notably in the energy industry, with well-publicized evolution occurring in the way society considers the creation, delivery, and disposal of its power sources. Forward thinking investors are watching this sector closely, a prevalent theme investigated in a related 2009 Insight Paper by Reynders, McVeigh, *Investment Opportunities in a Climate Change Economy* (.pdf download available at www.reyndersmcveigh.com/insights.html).

Less visible – but just as significant – is the steady decline of universal access to potable water, inarguably the most precious resource on the planet. Historically, water has been considered more like air (infinite and inexhaustible), while the public battle has literally raged over more clearly finite and exhaustible resources such as oil. But across the U.S. and the world, the supply of water is slowly being outpaced by demand. In our lifetime, it will become a commodity on a global scale; companies and investors that are positioned to be part of that exchange have the opportunity to play profitable, critical leadership roles in a new economy.

Even as nations meet to map out a more environmentally sound approach to business and manufacturing, resistance to drastic change keeps the world on a steady course of incrementally deteriorating conditions. Indeed, prescriptive mobilization against global warming was rejected at the Copenhagen Summit, underscoring the difficulties of a globally collaborative effort.

The same is currently true of the water crisis, which is also tied directly to global warming. Expected effects include wide temperature swings and more serious weather patterns. Increased pressure will be felt by suppliers of food and water, yet the ability to naturally generate these resources will diminish without innovative technology entering the mix. And the situation is already a cause for concern. A recent report by

Ceres and the Pacific Institute notes that if present trends continue, 1.8 billion people will be living with absolute water scarcity by 2025, and two thirds of the world population could be subject to water stress. In many areas of the world, a state of “peak water” is being approached in which demand will officially outstrip the rate of replenished supply. Peak water is not about simply running out, but is the peaking and subsequent decline of the production rate of the water.

Therein lie the investment opportunities, as efforts around conservation and replenishment will be the main pillars supporting these trends. Companies that stand ready to ease the situation with advanced technologies in these areas will leap to the foreground.

Investment Opportunity 1: Water conservation

In most parts of the country, water rates are still quite low. Relative luxuries such as cable TV and cell phone service cost quite a bit more than water, which has been seen as a necessity that should be distributed at a low price.

However, the cost of that perceived right to water is already on the rise in some communities. In Arizona, for example, the price of water rights has over the past thirteen years easily outpaced increases in the price of oil. According to Global Water Intelligence, water prices worldwide rose by 9 percent last year, well above inflation.

It is critical to temper these pricing strategies with conservation efforts that will help preserve the integrity of the resource, a task that in large part rests with the agricultural community. The 2009 report by Ceres notes that “agriculture accounts for more than two-thirds of global water use, including as much as 90 percent in developing countries. Freshwater consumption worldwide has more than doubled since World War II and is expected to rise another 25 percent by 2030.”ⁱ

With this in mind, a clear need exists for managing systems that will have an impact on water consumption and conservation:

- *Irrigation*

According to the Food and Agriculture Organization of the United Nations (FAO), “while feeding the world and producing a diverse range of non-food crops such as cotton, rubber, and industrial oils in an increasingly productive way, agriculture also confirmed its position as the biggest user of water on the globe. Irrigation now claims close to 70 percent of all freshwater appropriated for human use.”ⁱⁱ

Improved, efficient irrigation is paramount to curbing excessive water use in agriculture. In 2003, 44 percent of U.S. irrigation was accomplished with flood methods, a practice estimated to be only 60 percent efficient

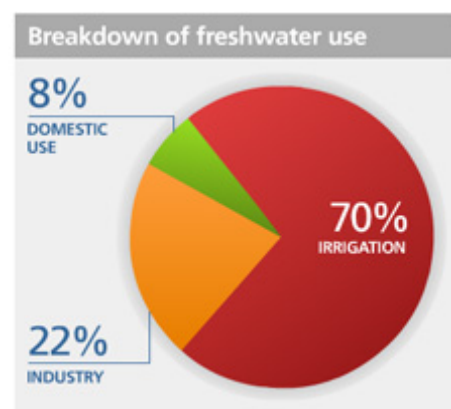


Figure 1 United Nations Water Use Statistics

compared with the high efficiency (94 percent) of spray irrigation.

Even more efficient than spray irrigation is drip irrigation, a practice that sees heavy use in arid climates and is predicted to gain more acceptance in the U.S. in coming years. Drip irrigation delivers water predictably and directly to plant roots, making it a highly effective and conservative method. Indeed, water can in essence be delivered drop by drop to crops in the exact ratio required and at the time most conducive to growth.ⁱⁱⁱ Even small changes to the way farmers water crops can result in a 10 to 15 percent gain in efficiency.

Those far from the countryside can also help conserve. With more than 50 million acres, turf grass is equivalent to the largest watered crop in the United States.^{iv} As water prices rise at twice the rate of inflation, consumer demand for water-efficient grass and other plant life continues to grow. Seed companies are responding with new products, and the National Turfgrass Federation's Research Institute is working to develop objective criteria by which the water-efficiency of each type of seed, and eventually sod, can be judged.

- *Metering*

Means of measuring water use will be increasingly important as more complex pricing structures call for automated meters to be deployed by water utilities. While a worldwide concern, California took the lead with 2004 legislation that requires all homes to be metered for water consumption by 2025. To speed the process along, the state is putting nearly \$50M in federal stimulus funds towards their installation.^v

This is a tall task given that only about 30 percent of the state's homes currently have meters that allow for automatic readings and the potential for variable pricing. But according to Ed Osann, Senior Policy Analyst at the Natural Resources Defense Council (NRDC), a new generation of meters equipped with internet connections or radio transmitters is making the process far easier and more efficient. These new meters allow for readings on an hourly or quarter-hourly basis, as opposed to the monthly, bimonthly, or even quarterly basis that most water companies now use.

Consumers can use this granular data to spot leaks or service issues before they become a major problem. An hourly meter that shows a small but steady flow all night long – while most people are asleep – may be an indication of a faulty valve or punctured pipe somewhere in the system. When readings are taken only every 30, 60, or 90 days, such leaks can go undetected for months, wasting hundreds of gallons. Unfortunately, this is often now the case and as much as 20% of treated drinking water is lost to leaks.^{vi}

“When utilities can take this granular look at flow rates, they can more easily see the kinds of leaks that can take place without consumers even knowing about them,” said Osann. “We see AMI as having quite a bit of potential for savings in both water and labor, although service will spike in the short term in response to more leak inquiries.”

Variable pricing is also growing in use. The NRDC notes that some communities have begun setting quotas for the irrigation of large parcels of land. Developers that stay within the quota benefit from discounted water; those that overextend pay dramatically more.

Investment Opportunity 2: Increasing Supply

There is little doubt that the amount of clean, drinkable water is in gradual but steady decline. Conservation and metering will play a major role, but efforts to increase the supply of drinkable water are also crucial to turn the momentum. Current initiatives focus on two major areas: desalination and purification of grey water.

- *Desalination*

With an estimated 14,000 desalination plants worldwide being driven by a core human and global need, an emphasis on technology and production will propel this sector. Over the past decade, desalination has grown at nearly a 25 percent rate, and growth going forward is expected to be at least 10 percent per year. Some estimates are much higher, depending on the application of new technology.

Desalination has been an extremely energy intensive technology, thereby limiting its broad growth potential. The most common traditional process utilized was thermal desalination, through which saltwater is boiled and the resulting steam captured and distilled into potable water. Newer plants, however, are focusing on reverse osmosis in which seawater is forced through membranes to remove salt, a practice that is now employed in over 70 percent of new plants. While still not a cheap technology, this advance has lowered costs to some degree.

In the near-term and in light of the stall at Copenhagen, rising energy prices should inspire continued technology breakthroughs for desalination, bringing more aggressive growth targets into view.

- *Water Reuse*

With migratory patterns in the United States and elsewhere continuing to favor arid regions, competition for scarce freshwater supplies among residential, commercial and industrial users is intensifying. As a result, strained surface and groundwater sources are placing communities under increasing pressure to find alternative means of meeting the freshwater needs of citizens and businesses.

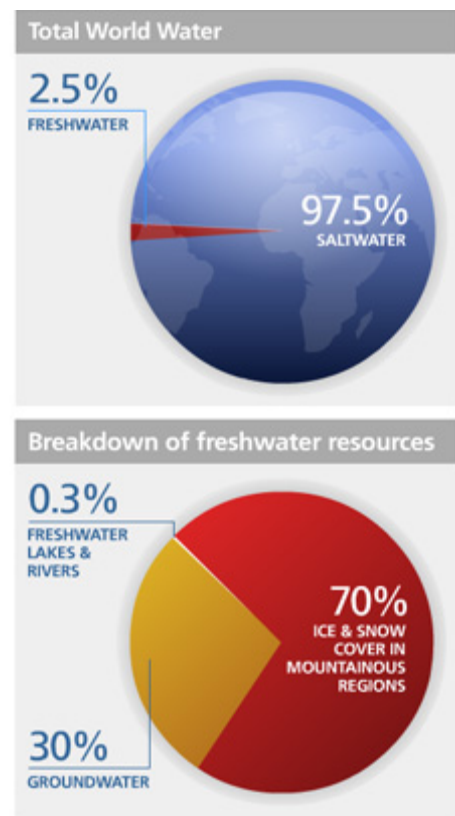


Figure 2 United Nations Water Resources Statistics

Against this backdrop, direct water reuse – the process of treating municipal wastewater in order to remove contaminants so that water can be safely reused for a variety of purposes – has emerged as a cost effective and environmentally sustainable alternative for communities seeking to address mounting supply and demand imbalances.

Though agricultural water reuse has been practiced for decades, the concept of treating wastewater streams for immediate re-entry into the water cycle is gaining traction, unlocking a “hidden source” of potable supply for many areas. In Orange County, California, advanced technologies are used to purify runoff water above bottled water quality. It is then allowed to infiltrate back into the ground, replenishing natural aquifers.

Returning this “grey water” to the hydrologic cycle is only one possible option. Some fire departments are now using it to fight fires. Stormwater runoff can also be used to irrigate parks or golf courses, mix concrete, or even flush toilets. In a place like Southern California, reusing grey water consumes only about half the energy that would be required to bring in clean water from the north. This is a crucial savings as the water sector in that state accounts for 19 percent of the total electricity consumed.

There are currently over 70 major water reuse projects being constructed in the world, a significant acceleration over the previous pace of growth in this sector. One recent study indicated that the water reuse market should grow by 180 percent by 2016, versus an estimated growth of 120 percent over the same period for water desalination. Water reuse projects are expected to benefit from lower costs versus desalination, as well as a greater acceptance of recycling.

Filtration, reverse osmosis and ultraviolet (UV) purification are all technologies that have applications in this growth, though it is worth noting that UV technology has been used in all recent large scale projects. These initiatives are capturing the inherent advantage of UV treatment, which helps to purify water by replacing the use of chlorine - a known poison that is believed to have negative side effects on human health.

The water crisis is steadily gaining recognition as one of the world’s most pressing issues. Ongoing efforts in developing nations are focused on battling drought conditions in populous regions, while in the U.S. there is a growing emphasis on water education. In fact, an IMAX film, *Grand Canyon Adventure: River at Risk* (released in 2008 and produced in part by *Reynders, McVeigh Capital Management*) gained wide acclaim for its telling of the plight of the Colorado River – once the lifestream of the Southwest but now a drying, limited resource.

As the situation unfolds, education and business will unite to provide the next generation of solutions for distributing, conserving, and replenishing supply. Well-positioned players will capitalize on the need for innovative technology, and investors who understand the issues and scope of the crisis will gain from early entry into the marketplace.

About the Authors

Charlton Reynders, III, Chairman and CEO of Reynders, McVeigh Capital Management, has more than 15 years of experience in investment management and social venture investing. His passion for forward thinking investment strategy rooted in fundamentals has provided a guidepost for his success to date.

In addition to his leadership in the traditional investment management world, Chat has structured and funded public/private partnerships that have brought more than \$150 million in revenues to leading cultural institutions around the world – projects that have won numerous awards. In this vein, he has for decades produced socially-oriented IMAX films including *Dolphins*, which was produced in conjunction with the National Wildlife Federation and garnered an Academy Award nomination in 2000, and *Coral Reef Adventure*, which received the largest grant in the history of the Informal Science Division of the National Science Foundation. He currently sits on the Advisory Boards of Project Adventure and the MacGillivray Freeman Educational Foundation.

Patrick McVeigh, President and Chief Investment Officer of Reynders, McVeigh Capital Management, is widely recognized as a pioneer in bringing traditional investment management together with socially responsible investing. He was one of three original employees at Trillium Asset Management; his research was key to asset growth from startup to \$700 million.

A voice of reason and leadership within the socially responsible investing realm, Patrick has served as Managing Editor of *Investing for a Better World*, authored numerous articles on ethics and ecology, and contributed chapters to *The Social Investment Almanac* (New York: Henry Holt, 1992) and *Working Capital: The Power of Labor's Pensions* (Cornell University Press, 2001).

Since 1995, Patrick has been project manager for a series of groundbreaking studies conducted by the Social Investment Forum, tracking the growth of socially responsible investing and its implications in the investment markets. He also served on the boards of SEED: The Haitian Community Loan Fund, directing approximately \$1 million to peasant cooperatives in Haiti to create businesses; the Social Investment Forum; and the San Jose Food Co-operative.

Endnotes

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