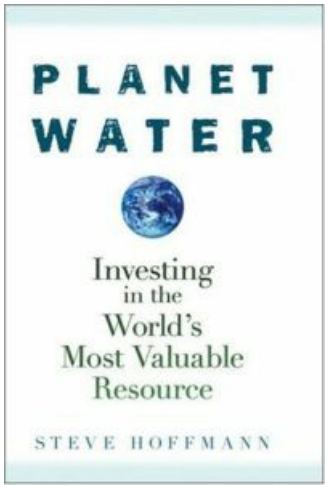


# Book Planet Water

## Investing in the World's Most Valuable Resource

Steve Hoffmann
Wiley, 2009

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## Recommendation

This remarkable, dense book about water covers its uses, chemistry, issues, supply and technology, as well as the modern global water business. Steven J. Hoffmann, a water investment expert, explores the connections among water ecology, regulation and economics while identifying specific investment targets. This volume is for disciplined investors looking to exploit Hoffman's information to further their own research. While finding the text somewhat long-winded and dry, *BooksInShort* recommends it to technically oriented, serious investors seeking immersion in the water industry.

## Take-Aways

- The water business is the world's "third-largest industry, behind oil and gas production and electricity generation." The value of water is only going to increase.
- Structural shifts in water management and regulation present great investment opportunities.
- Water is subject to the same value fluctuations as any other commodity.
- Every single nation seeks solutions regarding the amount and purity of its water supply.
- As water becomes scarcer, governments will spend vast amounts on building water infrastructures and related treatment services.
- Water is critical to industry. For example, fabricating one six-inch semiconductor wafer requires 2,300 gallons of water.
- Investors, who can buy water utility stocks and exchange-traded funds, divide the water industry between potable water firms and waste water treatment facilities.
- Decentralized treatment plants and desalinization are becoming more popular and viable.
- The issues that may affect water-related investments vary from out of date infrastructure to storm water runoff pollution to global warming and political disputes.
- Future generations should have the same access to quality water as people do today, or better.

## Summary

### "Planet Water"

Water, the source of life, has existed on Earth for 3.8 billion years. Some 39 billion cubic kilometers of water cover 75% of the planet's surface, the same total amount that existed millions of years ago: 97% salt, 3% fresh. Water appears in liquid, frozen and gaseous forms within common temperatures and pressures. Water vapor is the atmosphere's third most common gas and redistributes energy through heat exchange and condensation. Water moves through a continuous cycle of evaporation, condensation, precipitation and collection, though global demand and climate change affect this cycle.

> "Water will be the resource that defines the 21st century driven by a substantial increase in its value."

Scientists do not fully understand the behavior and function of water (hydrogen oxide), including its electrochemical properties. Because of the extensive bonding in water's hydrogen molecules, it has the second highest specific heat capacity of any compound (except ammonia) and vaporizes at a high temperature. This allows water to buffer the Earth's wide temperature fluctuations. Water thus enables the oceans to retain heat, which plays a large role in global warming and has a huge impact on the planet's ability to maintain worldwide seasonal temperatures.

## Dirty Water

According to the World Health Organization, while water itself is abundant, 1.1 billion people do not have easy access to clean drinking water. About 40% of the world's population lives in areas without adequate sanitation, which helps explain why 50% of all hospital beds hold patients suffering from waterborne and water-related diseases. This global health problem has drawn the attention of major institutions. Since water sources do not respect national boundaries, policy development, quality standards, implementation and administration differ widely among nations sharing the same water source.

> "Every country in the world is presented with some combination of water quality and quantity issues."

In the United States, water regulations govern current and future water quality standards, as well as utilities which process drinking, waste and storm water. State and local bodies work with the federal Environmental Protection Agency (EPA) to set quality standards, but states manage their own water, waste water systems and standards, enforcement, and penalties for quality violations. The main U.S. legislation on surface water, the Clean Water Act of 1972, regulates waste water discharges into bodies of water and other issues. Various laws, regulations and policies drive innovation in the water business, which relies on technology to detect contaminants (often expressed in concentrations of parts per trillion), as well as to treat water and manage resources.

> "The importance of the water and waste water infrastructure in safeguarding health, supporting economic growth, and protecting the environment cannot be overemphasized."

As water becomes scarcer, governments worldwide will spend vast amounts on building water infrastructures and related water treatment services, presenting investors with opportunities in storm water management and sewer overflows. The Organization for Economic Cooperation and Development (OECD) estimates that just 20 of its member nations, plus Brazil, Russia, India and China, will need to spend $15 trillion on these processes. In the U.S., the EPA predicts necessary spending of $202 billion to enable publicly owned water treatment works to build facilities to handle waste water, collection, storm water management and recycled water.

## Liquid Opportunities for Investment

The water industry is the "third-largest in the world after oil and gas and electricity generation." It's uniquely fragmented, comprised of many companies and functions. Increasing demand could drive significant consolidation, accompanied by mergers and acquisitions, initial public offerings, and private equity investment. Due to increased consolidation, competition, privatization and technology convergence, this growing industry faces fundamental change in its way of doing business. It is vulnerable to the influence of industrialization, urbanization and globalization.

> "Water is transitioning to an economic good, but it is also a resource with paramount ecological significance."

Investors divide the water industry between companies that provide potable drinking water and those that treat waste water. Each segment has different processes, plant designs and regional requirements. The Palisades Water Index offers a breakdown for investors that tracks water companies according to functionality by category: utilities, treatment, analytical, infrastructure, resource management and multibusiness.

> "Despite unprecedented economic progress on a global scale, environmental issues have been largely neglected as a critical component of continued growth."

Many industrial and commercial users, such as the semiconductor industry, need ultrapure water. For every $1 of water semiconductor manufacturers purchase, they spend $20 on purification and $10 to treat their waste water. Fabricating one six-inch wafer requires 2,300 gallons of water. A chip manufacturing plant can use up to one billion gallons of water annually.

## Water Utilities and Waste Water Treatment

Traditionally, municipal and private water utilities provided water to the public. Today, many of these utilities are publicly traded, and some utility companies' investment results have exceeded the returns of major stock indexes. Water utility privatization came to the U.S. when Vivendi acquired U.S. Filter in 1999. Another large French utilities group then acquired the second largest water distributor in the U.S., United Water Resources. These acquisitions helped focus attention on water as an asset category.

> "Any time there is a structural change in an industry caused by shifts in the economic fundamentals, there is a huge potential for corresponding economic gain."

Treating water and waste water involves removing microbes, organic and inorganic chemicals, and handling sediment disinfection and filtration. Investors entering this sector should be wary of the technological risks, as well as other factors that affect water utility investments, including interest rates, regulation and weather conditions. However, proven technologies should achieve above-average growth. Utilities can benefit from consolidations, takeovers and business exposure, particularly in countries that have less regulation than the U.S. plus rising per capita incomes that can absorb higher water rates.

> "What the water utility of the 21st century will look like is perhaps one of the greatest uncertainties in the industry."

New technologies and economic models make the case for decentralized treatment facilities instead of the traditional centralized resources. These decentralized treatment plants are especially attractive in emerging economies and may represent an institutional change in developed nations as well. Big brands – Procter & Gamble, General Electric, Culligan – have entered the home water treatment industry, accompanied by rising demand for point-of-use (POU), whole-house and under-the-counter water purification systems. In addition to convenience, POU systems are more economical and provide better compliance with EPA water quality standards, especially in removing specific contaminants. The EPA is experimenting with remote monitoring technologies, similar to those used by home security companies, to check POU systems.

> "Lack of water does not cause poverty, but poverty virtually always includes a lack of water."

Patient investors should also consider groundwater treatment process companies. Groundwater is the primary source for 93% of the U.S.'s public water systems, and 75% of American cities rely on it for drinking. But pollutants can seep into groundwater, and it can remain contaminated for hundreds of years. Federal, state and local authorities have enacted numerous protective regulations. At least four major federal laws address groundwater contamination from various sources including underground storage tanks, septic systems, landfills and agriculture.

### Water and Waste Water Infrastructure

Water infrastructure consists of the pumping stations, treatment distribution, storage and other facilities that deliver water, and wastewater systems with sanitary and storm sewers. The most common problem facing these systems, especially in older cities, is the deterioration of pipes, which result in leaks and contamination. Sections of the St. Louis, Missouri, sewer system were installed before the Civil War. Leaks were so extensive in Boston, Massachusetts, that half its water supply was being lost after it was distributed. These problems represent a great expense, since the lost water already had been chemically treated and processed. Leak detection firms now use sophisticated technology, including acoustics and data analysis, to cross-correlate leak signals.

> "It is critical that the global water utility sector transform itself into a solutions-based system, providing safe drinking water in a cost-effective manner to reliably serve its shareholders."

Impaired water quality also results from storm water runoff that carries fertilizers, pesticides and organic compounds. The EPA has increased its efforts to monitor runoff; the agency estimates that U.S. communities will need $140 billion over the next 20 years to meet new water quality standards. This covers outlays for sewer overflows, waste water treatment and sewer construction, and for upgrading water collection systems and controlling municipal storm water. This segment presents new investment opportunities, especially in emerging pumping technology. These advanced pumps (including self-actuating, controllerless pneumatics) also are useful in landfills.

### Analyzing Water

Testing, analyzing and monitoring water is a $21 billion-a-year global business. These processes are becoming more important due to new regulations, cost controls and system oversight. Water utilities now are using automatic meter reading (AMR) to monitor consumption and to create more accurate bills, detect water leaks in real time and better manage system demand. The AMR method requires more sophisticated two-way electronics, power sources and computer interfaces. For instance, Denver Water installed AMR technology on 220,000 meters, each with a miniature radio transmitter to convey data. AMR is also an important part of recovering water costs. A U.S. General Accounting Office study found that 29% of drinking water utilities and 41% of waste water utilities were not recovering their costs from user payments. This shortfall, combined with the need for more infrastructure spending, forces water and waste water utilities to enact better system monitoring controls that rely on sophisticated data management and geographic information methods.

### Sustaining the Water Supply

Resource sustainability can seem contradictory to economic development, but environmentalists and water resource experts agree that future generations must continue to have access to drinkable water. Translating that goal into water policy, current practices focus on preserving the quality of watersheds and protecting them from contamination. A watershed is any land area that drains water, sediment, heat or dissolved materials into a common water outlet. Since this involves many sources and political jurisdictions, watershed management requires a comprehensive strategy. Companies in engineering and consulting, design, hydraulic modeling, construction, and environmental restoration can benefit from participating in this holistic approach.

### Making Salt Water Usable

Desalinization treatment removes dissolved minerals and solids from salt water. This process commonly uses distillation, freezing, solar humidification and membrane processing. Worldwide, about 14,000 desalinization plants are active, mostly in Saudi Arabia and Spain. In the U.S., desalinization is used to process brackish (highly mineralized) water, primarily by reverse osmosis and membrane technology. As treating brackish water becomes cheaper, more utilities are looking into the process. The water utility in El Paso, Texas, built the world's largest inland desalinization plant to treat water from the local aquifer and the Rio Grande River. This plant now provides enough drinking water to meet the future needs of El Paso and nearby Fort Bliss.

### Investing in Water

Investors can buy stock in companies in all aspects of the water industry, as well as exchange-traded funds (ETFs) based on water indexes. These ETFs are based on the Palisades Water Indexes, the S&P Global Water Index and the ISE Water Index. Each index has different weighting methods, underlying stocks, rebalancing and company replacement schedules. Some 16 mutual, private equity and hedge funds focus on firms in the global water industry.

> "All water is eventually reused; the hydraulic cycle is a closed system of continuous water circulation."

Changes in climate and hydrology should drive these investment opportunities. While experts continue to debate the impact of climate change, investors can be confident that weather uncertainty is increasing as demonstrated by the measureable rise in greenhouse gases, more frequent heat spells and declines in precipitation in the western U.S. These events influence stream flows, drought conditions and snow packs. For water planners and water utility managers, such changes shape plant design, capacity considerations and water quality. Investors should recognize that even though water has intrinsic, utilitarian value, water company stocks are subject to the same forces that affect other industrial stocks.

## About the Author

**Stephen J. Hoffmann** founded WaterTech Capital, a private investment company, and is co-founder and principal architect of the Palisades Water Indexes, tracking indexes for water ETFs. He is also a contributing editor to the *Water Investment Newsletter*.