Water – elixir of life and investment theme

Sustainable Investment in water

May 2012
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Water – Vital for growth!

Water, energy and food probably present the most complex challenges for the newly emerging economic, political and social world order. Anyone creating an investment portfolio for the next five or indeed fifty years would do well to consider the growth opportunities and attractive valuations of this multifaceted investment theme.

A small but representative example may serve to illustrate the point: the South China Morning Post recently reported that, in the Chinese province of Yunnan, over six million people and around four million farm animals are currently suffering from an acute shortage of water. The government is using tanker trucks to distribute water to the population, at the rate of twenty litres per person per day. By comparison: a typical Swiss household consumes almost ten times as much on average. The provincial governor Qin Guangrong fears that soon nearly eight million people will be affected in his area. The desertification and high risk of fire that go with water scarcity currently endanger some five million hectares of arable land - about five times the whole of Switzerland’s arable land area. The endangered land currently produces 83% of the sugar cane, 50% of the rubber, 25% of the bananas and citrus fruits, 30% of the tea, 50% of the tobacco and 20% of the rice grown in China. Falling reservoir levels and an inefficient irrigation infrastructure are chiefly to blame for this situation. The country’s 134 largest reservoirs now hold 21% less water than they did last year. Without additional water treatment, the majority of Chinese cities will irreversibly exhaust their groundwater reserves within a few years. On the 2200 km long Xijiang River - one of the country’s principal transport arteries - stranded cargo ships are no longer a rare sight, due to low water levels. Supply disruptions affect the whole region, as the Xijiang carries large quantities of basic foodstuffs bound for destinations in South-East Asia.

Water shortage is not just an Asian problem, but one that also affects the USA and Europe. There is enough fresh water in the world to satisfy the water needs of all people for all time. However, water must be in the right place at the right time. Transporting water over long distances is expensive. That is why London, for example, is building its own seawater desalination plant, rather than bringing fresh water down from the Lake District. Sewage drainage and treatment also pose an urgent problem and are a necessary part of a sustainable water supply system. Today China has just under 2,000 sewage treatment plants, while Germany has around 10,000. In view of these trends, the World Bank forecasts that investments in water infrastructure this decade will grow around ten times as fast as in the transport sector. And because the technological, political and environmental challenges are so complex, this investment theme has not only great market potential but also outstanding margin potential. Specialised, sustainably managed investments in the water market are a must for any long-term portfolio!

I hope you enjoy reading this report.

Best wishes

Burkhard P. Varnholt, Chief Investment Officer
Elixir of life and attractive investment theme

Water is a sustainability issue *par excellence*. It is also an attractive investment theme. Bank Sarasin has assembled a universe of companies that make a sustainable contribution to water supply and wastewater treatment. As well as utilities, the sustainable water universe also includes technology companies that manufacture components for water supply infrastructure, as well as service providers and firms from water-intensive sectors that distinguish themselves by their sustainable use of water. In the last five years the sustainable water universe has easily outperformed the global equity market (MSCI World Index).

**Essential and irreplaceable**
Water is vital for people, animals and plants and nothing else can replace it. Water is also indispensable for industry and agriculture. It is the very epitome of a renewable resource, yet its availability is limited, since most of the world’s fresh water is not to be found in the places where people need it. Water must be permanently available and it must be clean.

**Soaring demand, limited supply**
Demand for water grows at 2% per year - faster than the world’s population. This will remain the case for the long term. The causes have mainly to do with rising living standards in the newly industrialised countries and a lack of further agricultural land watered by natural rainfall. The water shortage is exacerbated by increasing urbanisation, as regional sources are limited. According to UN estimates, in 15 years’ time 1.8 billion people will live in regions with an absolute water shortage, and two thirds of the world’s population will suffer from occasional water scarcity. The problem is by no means confined to especially hot regions of the world, but increasingly affects temperate zones (such as south-east England).

**Rain is free, infrastructure is not**
The production and supply of water require infrastructure, as do the drainage and treatment of wastewater. Expenditure for drinking water supply and wastewater disposal corresponds to just under 1% of GDP. Wastewater accounts for nearly half of that.

**Investing in water**
Mains water – unlike other materials such as gold for example – is not a tradable commodity. Consequently there is no way of investing in a “water market”. In view of the growth prospects, water infrastructure is a very attractive investment theme. The worldwide annual turnover of water utilities and manufacturers of infrastructure components (pipes, pumps, filters, construction services, etc.) amounts to USD 650 billion. Technology companies are the more interesting side of the water sector, as 90% of utilities are owned by the public sector. The utilities spend 44% of their sales on components.

**Sarasin’s sustainable water universe**
Bank Sarasin has compiled a universe of companies that make a sustainable contribution to the supply of water and treatment of wastewater. The sustainable water universe also includes industrial companies from water-intensive sectors (e.g. paper) that distinguish themselves by their sustainable use of water. In the last five years the sustainable water universe as defined above has easily beaten the global equity market (as measured by the MSCI World Index), with a performance of 22%.

**Attractive prospects**
In the advanced economies, ageing water networks increasingly need to be renewed so as to prevent leakage rates from rising further. Today, on average 25% of fresh water is lost through leaks in the network. In the newly industrialised and developing countries, the water infrastructure needs to be massively expanded. Increasingly expensive, high-tech solutions are being used to produce fresh water and treat wastewater. All in all, Bank Sarasin expects the sales of water companies to grow by 4 to 5% in real terms up to 2020.
A very precious substance

Without water, life as we know it is not possible. It is essential and irreplaceable, for us and for the economy. There is plenty of water in the world, but there is not always enough clean water in the places where it is needed. More and more people are affected by temporary water shortages.

Essential and irreplaceable

Water is a fascinating substance. It forms the basis for all life on earth. We find \( \text{H}_2\text{O} \) in its different forms wherever we look – in the shower, in your coffee cup, as fog and rain, in raging torrents or gently flowing rivers, on the ski slopes, in cloud formations, in your washing machine, on the beach. Water is a sustainability issue *par excellence* and people will always be concerned about it. Since water is essential for people, animals and plants, it clearly touches on the environmental dimension of sustainability. The social dimension is reflected in the 2010 UN declaration that access to clean water is a human right: every person needs a certain minimum amount of clean water every day. Each year around two million people die as a result of unclean water.

Fig. 1: Access to fresh water 2010

![Access to fresh water 2010](image)

Source: AquaFed

Has the Millennium Goal been achieved?

Development targets for the year 2015 were defined at the United Nations Millennium Summit in 2010. Amongst other goals, the percentage of people without permanent access to clean drinking water should be reduced from 65% to 32%. At the World Water Forum in 2012 it was announced that this target had already been achieved. Substantial progress has undoubtedly been made. However, critics complain that the target was formulated retrospectively. The words “safe drinking water” were changed to “improved water source” in order to make development more measurable. However, “improved water sources” sometimes supply water of doubtful quality (see Fig. 1).

A quintessentially renewable resource

Nature supplies water free of charge through a solar powered cycle in the form of rainfall, though it is unevenly distributed in time and space. To supply clean water continuously in all the places where people need it requires a suitable infrastructure, and this is where the economic dimension of sustainability comes into play. Furthermore, water is indispensable and irreplaceable not just for people and nature, but also for economic activity: for agriculture, as process water in industry, for hydroelectric power or as cooling water for power generation. Many leisure activities also depend on water.

Sustainable bottled water?

Sales of bottled water amount to around USD 60 billion annually. We do not consider bottled water producers as belonging to the water sector, as bottled water is not a sustainable alternative to tap water. It is precisely in regions without adequate water supplies that the broad mass of the population cannot afford bottled water. Moreover the environmental cost of bottled water is between 100 and 1000 times that of tap water, depending on the transport distance and packaging.

A multifaceted theme

Water is such a multifaceted and complex topic that this report does not claim to represent anything like an exhaustive appraisal. We confine ourselves to an
outline of the main points of relevance for investors interested in the theme of water.

**Determinants of water demand**

On a global average, 70% of water demand comes from agriculture and 22% from industry. Households account for just 8%. This distribution varies widely from one region to another and depends not only on the climatic conditions but also on the economic structure (see Fig. 2).

![Fig. 2: Water withdrawals by region 2005](source: FAO Aquastat)

Global water demand from households, industry and agriculture is increasing by roughly 2% every year and is growing faster than the population (see Fig. 3). In other words: per-capita demand is rising.

![Fig. 3: Water withdrawals relative to world population](source: UN FAO Aquastat)

The disproportionate growth in water demand will continue over the long term. The causes are numerous and mainly to be found in the newly industrialised and developing countries. The most important factors are rising living standards and a shortage of productive agricultural land. There is great water-saving potential in agriculture, starting with the cultivation of plants with low water consumption and more closely targeted (drip) irrigation. Another important question is the water-intensity of people’s diets. As living standards rise in the newly industrialised countries, so eating habits shift in favour of greater meat consumption. On its way from field to table, a kilogram of rice consumes 3,500 litres of water. A kilogram of beef requires 15,000 litres. Also, a large amount of arable land is needed to grow fodder for meat production. However, there is a shortage of agricultural land watered by rain, so that expanding agricultural land usually requires artificial irrigation.

**“Virtual water”**

The quantity of water needed to manufacture a product is called “virtual water”. It accounts for most of human demand for water. In Switzerland, for example, direct water demand from private households averages 162 litres per person per day. To this must be added nearly 6,000 litres of virtual water, 66% of which relates to agricultural produce. An ever-increasing proportion of this comes not from rain falling on fields, but rather from groundwater or surface water. 65% of the virtual water is in imported products.

**Availability**

Demand for water is continuously rising. At the same time it is becoming increasingly difficult to provide clean drinking water. The regions already suffering from water shortages are shown in Figure 4. A distinction is made between physical water scarcity and economic water scarcity. The situation is set to get worse: according to UN estimates, by 2025 around 1.8 billion people will live in regions with an absolute water shortage, and two thirds of the world’s population will suffer from occasional water shortages.

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1. Physical water scarcity: more than 75% of river flows are allocated to agriculture, industries or domestic purposes.
2. Economic water scarcity: human, institutional, and financial capital limit access to water even though water is naturally available.
One problem is that of continuous urbanisation: the supply of water is a regional matter. Because of the high cost, water is hardly ever transported over long distances and water is not traded. When more and more people live in a small area, regional water production is stretched to the limit. Efficient water use and new methods of regional water management (e.g. recirculation of water in industrial processes, use of treated wastewater for irrigation) are becoming increasingly important. Climate change is making drought situations even worse due to changes in rainfall and evaporation patterns in many regions already threatened with water shortages.

Renewable and non-renewable water resources

Even renewable resources are limited. A sustainable water industry only uses water resources (surface water or groundwater) that can be adequately regenerated by rainfall. As a rule of thumb, no water shortage will occur throughout the year provided no more than 25% of the water replenished by rainfall is drawn off per year. In many regions, more groundwater is drawn off than is regenerated. This is true, for example, of the Ogallala Aquifer in West Texas. This leads to a falling water table, which in turn causes further problems such as the intrusion of saltwater from the sea. Some regions have fossil water located deep below the earth’s surface. These have been formed over geological periods of time and today are hardly ever replenished by rainfall. Excessive use of such water resources, as practised for example in Libya (the “Great Man-Made River” project) does not provide a lasting solution to the problem of water shortage.

Contamination reduces availability

An important issue for health and fresh water production is the treatment of wastewater. In many newly industrialised and developing countries, the production of fresh water is increasingly hampered by the contamination of surface water (Fig. 5).

Fig. 4: Areas of physical and economic water scarcity 2007

Source: FAO, 2007

Fig. 5: Ratio of treated to untreated wastewater discharged into water bodies 2010

Source: UNESCO
Investing in water

Investing in water means investing in utilities that operate the water supply and wastewater infrastructure, or in companies that manufacture the components of that infrastructure. The worldwide turnover of the water sector amounts to USD 650 billion. Demand for water is growing faster than the population and the turnover of the water sector faster than gross domestic product. Scarcity drives the need for increasingly expensive water treatment. In the advanced economies, ageing water networks need to be renewed. In emerging economies and newly industrialising countries, the infrastructure for water supply and wastewater treatment is being expanded. The water sector as a whole promises continuous growth over the long term.

Less than 1% of GDP is spent on water

Water is the renewable resource par excellence. It is provided by the never-ending, solar-powered cycle of evaporation and precipitation and costs nothing. Supplying water for daily use in households, industry and agriculture, on the other hand, requires an extensive and very expensive infrastructure. This consists of installations for collecting and treating fresh water and networks for distributing it. The mirror image of fresh water supply is the drainage and purification of wastewater. The wastewater infrastructure consists of sewage networks and treatment plants. Around the world, just under 1% of GDP is spent on fresh water and wastewater (by comparison, around 5% is spent on energy). Nearly half (43%) of the expenditure relates to wastewater.

The water industry

This study considers the supply of fresh water and the disposal of wastewater used in households and industry. We also look at irrigation systems in agriculture.

There is no “water market”

Mains water – unlike other materials such as crude oil, gold, wheat, etc. – is not a tradable commodity. Consequently there is no “water market” nor any derivative financial instruments such as futures based on water, so there is no way of investing in water as a commodity. “Investing in water” means investing in companies whose products and services relate to water infrastructure.

This report does not deal with canals, dams or other hydraulic engineering works, or the use of water in connection with electricity generation. These activities can be important for the supply of fresh water, but they are primarily directed towards other purposes (e.g. coastal protection or power generation).

Industry structure

The water industry comprises not only water utilities but also the companies that supply them. These include, in particular, manufacturers of components such as pumps, pipes and valves and construction companies. Producers of irrigation systems and building installations equipment also belong to the water industry. The global turnover of the sector thus defined was approximately USD 650 billion in 2011.

Fig. 6: Global turnover of the water sector in 2011

Companies in the water sector are often also active in other fields. For example, water utilities often supply energy as well. Furthermore, most of the technologies used in the water industry can be applied in other areas. For example, most pump manufacturers also produce...
pumps for other applications, such as chemicals. This means that there are only a few companies whose entire turnover comes from water-related products. On average around 50% of turnover relates to water.

**Suppliers are of interest to investors**

The largest segment in terms of sales (see Fig. 6) is that of “Utilities”, which are usually also involved in wastewater treatment. However, utilities are predominantly owned by the public sector. On average throughout the world, private water companies account for around 10%. Therefore only a small proportion of utilities are accessible to private investors. Consequently the spotlight falls mainly on suppliers, since the utilities invest 44% of sales in components (pumps, pipes etc.) and construction works.

**Seawater desalination**

Within the space of 45 years, worldwide production of drinking water from the sea has risen from virtually zero to a current level of around 70 million m$^3$/day. USD 11 billion was invested in new desalination plants in 2010. Even so, this method of drinking water production meets only 0.4% of global drinking water demand. Global Water Intelligence forecasts that desalination capacity will grow to over 120 million m$^3$/day by 2016. Nevertheless there are concerns about desalination. It is comparatively expensive and highly energy-intensive. Even with the latest desalination technology based on reverse osmosis, a cubic metre of water costs over USD 0.5 and consumes around 5 kWh of energy. Desalination also has a substantial environmental impact, particularly where these systems proliferate as in the Gulf region (pollution of marine ecosystems due to chloric and acrylic acid emissions and local increase in salt content).

**Large investments in renewal and expansion**

In addition to growing demand coupled with limited supply, the water industry is also facing a number of other challenges and opportunities. The water infrastructure of most industrialised nations has been built up over the last 150 years. Assuming an average life expectancy of around 50 years, 2% of the water network needs to be renewed every year. In most countries, however, there has been little or no investment in renovation work for many decades. On average, roughly a quarter of mains water is lost through leaks. In the advanced economies, there is a growing need to renovate networks to prevent the amount of water lost to leaks from rising still further. In emerging economies and newly industrialised nations, the main challenge is the expansion of the water infrastructure. The emphasis here is on ensuring effective wastewater treatment, since the pollution of water courses has reached a dangerous level and is increasingly threatening the provision of fresh drinking water. Another important trend is the growing use of (expensive) high-technology solutions to exploit additional fresh water resources (particularly through desalination) and also for wastewater treatment.

**The water industry is constantly growing**

The developments described all point in one direction: more money will inevitably be invested in water infrastructure. As a result, the water industry will grow at a faster rate than GDP – and continue to do so for many years to come. We expect the water sector to achieve an annual average growth rate of 4 to 5% in real terms up to 2020. This growth will be distributed differently over the various global regions and the individual segments of the water industry. The sales growth of utilities and also of the mainly regionally structured segments of the water industry (such as construction) will occur mainly in emerging economies. In the Technology segment, however, we expect sales growth to be concentrated chiefly in industrialised countries such as the USA, Germany and Switzerland.

**Investing in water rights**

Water rights are official permits to draw water from surface water bodies or aquifers. In some regions (such as Chile, Israel, California, the Canary Islands), the trading of water rights is allowed. This potentially opens up investment opportunities. However, the markets are limited and require specialist knowledge. Water rights are therefore unlikely to be a suitable investment vehicle for the majority of investors.

**And who pays?**

The growing need for investment will be largely financed by higher prices. For several years now, mains water prices have been rising on a broad front: in the period from July 2010 to July 2011 alone, prices rose by an average of 6.8% across 308 major towns and cities worldwide. In poor countries, the public sector lacks the capital to expand the infrastructure. Privatisation can only make a limited contribution, usually requiring the involvement of development banks. Recently, however, these have tended slightly to reduce their water investment programmes.
The sustainable water universe

The Sarasin sustainability research team has selected a whole range of eligible companies for the theme of water. This “water universe” allows sustainable and highly focused investment in companies involved in the water sector, with the promise of attractive absolute and relative returns.

Features of Bank Sarasin’s water universe

The sustainable water universe of Bank Sarasin features the following characteristics: all companies must have a clear connection with the theme of water. This means that products used for supplying water or for wastewater drainage and treatment or for agricultural irrigation must make a decisive contribution to the companies’ sales, or that the companies must be technology leaders in this area. It is also possible to invest in companies that operate in a water-intensive sector (e.g. the paper industry) and are distinguished by particularly sustainable use of water. All companies of the water universe are first subjected to a sustainability analysis (for method, see annex) and must receive at least an average sustainability rating compared with their peer group. As with all of Bank Sarasin’s sustainability funds, certain exclusion criteria also apply. In the case of the water sector, the exclusion criteria are nuclear energy and armaments.

Exclusion criteria: nuclear energy and armaments

Technologies used in water treatment and distribution are often also applied in other areas. For example, filters, pumps, etc. are also used in nuclear power stations. Membrane filter technology can also be used in the context of chemical weapons production. Companies that achieve more than 5% of their turnover with military customers or in connection with nuclear energy are excluded from the water universe. This affects the companies Tetra Tech, Pall and Danaher, amongst others.

From a financial perspective, special attention is paid to solid companies that achieve a positive capital flow. The universe also focuses on small and medium-sized companies and is overweight in technology stocks versus water utilities. Bank Sarasin does not include companies that produce bottled water (e.g. Nestlé, CocaCola, PepsiCo and Danone) in the sustainable water universe (see box on page 8). In view of our consistent focus on the theme of water for use in agriculture, in industry and by people, we do not include companies from the field of hydroelectric power (e.g. the electric utilities Verbund, EVN or RePower) in the water sector, but instead assign these to the theme of renewable energies.

The water universe in the sustainability matrix

The sustainability ratings of companies can be plotted on the Sarasin Sustainability Matrix. Figure 7 shows the positioning of selected companies from the water sector. The wide distribution of companies along the horizontal axis reflects the large number of sectors which are relevant to the theme of water.

Fig. 7: Sarasin Sustainability Matrix with selected companies from the water sector

Source: Bank Sarasin

To the left of the matrix are companies such as Georg Fischer (GF), Rotork or Kubota from the mechanical sector.
engineering sector and the water-specific themes of pumps & valves or irrigation equipment. In the middle of the horizontal axis we find companies concerned with consumption metering and billing, such as Itron, Badger Meter and Elster Group. Here we also find companies from the consumer goods and packaging sector (Henkel or Mayr Melnhof), which distinguish themselves through water-saving production processes. On the right-hand side of the matrix are water utilities such as Pennon, Aqua America and China Everbright. The chart also shows some ineligible companies from the water sector by way of example (non-shaded area or excluded due to involvement in armaments or nuclear energy.

**Performance of the Sarasin water universe**
The water industry is in a long-term, structural growth phase, which is reflected by share price movements of the companies concerned over the longer term. In certain phases, however, water companies are also affected by cyclical trends. Over the last five years, which have seen both upturn and correction phases, the water sector has performed well relative to global equity markets as measured by the MSCI World Index. In the last five years (30.4.2007 to 30.4.2012) the Bank Sarasin sustainable water universe has risen by 22% (Fig. 8). By comparison the MSCI World has fallen by 3%. In upturn and recovery phases, the water shares have clearly outperformed the market as a whole. In 2009 and 2010 the water stocks outperformed the market by 18 and 5 percentage points respectively. Industrial production rose by more than average and cyclical stocks were more highly valued by the market. Price gains by small and medium-sized companies – most water companies fall within this category – surpassed those of large caps. Further developments and innovations in the treatment, purification and more efficient use of water resources come from the technology companies in the water sector. The water utilities, on the other hand, exhibit continuous growth over time. They offer investors solid returns on stable to slightly declining sales and have a stabilising effect during correction phases. The price movements of utilities depend more on interest rates, the availability of loan capital and the regulatory environment, and less on economic trends. Earnings drivers include improvements in operational efficiency, good capital and debt management and a good relationship with a constructive regulator. We believe investors will benefit from a globally balanced portfolio of water stocks covering a good range of sectors. If a certain degree of price fluctuation can be tolerated, a focus on the technology segment of the water sector will prove the most rewarding over the long term.

**Fig. 8: Performance of sustainable water stocks**
*compared with the MSCI World Index*

![Graph showing performance of sustainable water stocks compared with the MSCI World Index](source: Datastream, Bank Sarasin)

**Water indices**
The performance of investments in water is normally measured against a global equity index, showing the return compared with the global equity universe. Alternatively an index that tracks the water sector or a peer group comparison of water funds could be used. What is needed is a water index from an established index provider such as MSCI which tracks the water sector in a representative, transparent and comprehensible way. Existing indices such as the World Water Index, S&P Global Water Index or Palisades Global Water Index only partially fulfil those requirements. On the whole they are not so transparent and either focus too much on utilities or are concentrated on a handful of titles.

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Appendix

Sustainability Analysis Methodology

**Matrix combines industry and company ratings**
Our environmental and social analysis of companies is based on a proprietary valuation method developed by Bank Sarasin. It incorporates two dimensions which are combined in the Sarasin Sustainability-Matrix:

- **Industry rating**: Comparative assessment of industries using selected environmental and social criteria.
- **Company rating**: Comparative environmental and social analysis of companies within their industry. Only the companies positioned in the Sarasin investment universe (shaded) qualify for Bank Sarasin’s retail sustainability funds.

**Evaluation criteria**
When assessing individual companies, we consider how they handle the environmental and social risks specific to their industry and exploit the relevant opportunities. The main criteria are the same for all industries. They are compared with the industry average in the company’s environmental and social profile and then aggregated into an overall rating. The weighting of the main criteria and the selection of the subcriteria are industry-specific.

**Controversial activities**
Certain business activities which are not deemed to be compatible with sustainable development (e.g. armaments, nuclear energy, tobacco, pornography) can lead to the exclusion of companies from the Sarasin sustainable investment universe. The Fund’s Advisory Council makes this selection for our retail funds.

**Information sources**
The company rating is based on the company’s own details, press reports and information from independent institutions. The companies are contacted to clarify any open questions or contradictions. We do not use standardised questionnaires.
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Basel, May 2012  
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## Appendix

### Publications

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