

Longer Term Investments

Water scarcity

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- The World Economic Forum (WEF) considers water scarcity as one of the biggest risks facing mankind. Water-related products and services are diverse, ranging from water-specific consulting to desalination membranes, but two structural trends generally shape demand: population growth and urbanization.
- We believe there are long-term investment opportunities in water; opportunities that should remain valid for decades.
- Given the many factors involved and the long-term investment horizon, we advise investing in a well-diversified investment vehicle that offers global exposure to the entire water-value chain.

Our view

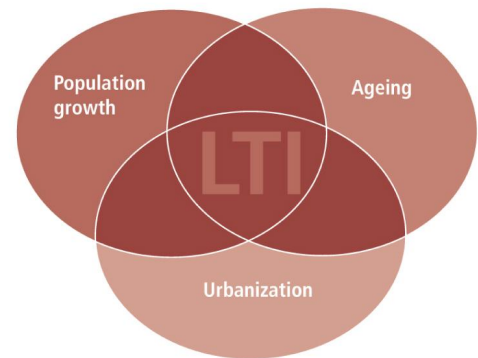
The latest WEF risk landscape identified that a water crisis – and the failure to adapt to climate change – is among the top five threats facing the planet. Global warming will affect the quality and quantity of water resources worldwide. The importance of water is undisputed and puts it at the forefront of longer-term development goals. So it should come as no surprise that water security is one of the UN's 17 Sustainable Development Goals and one that fits well with our sustainable investing framework.

As the world's population rises, increasing strain is being placed on the planet's limited natural resources which in turn hurts social and economic prosperity. It is not just population growth per se, but how and where that growth takes place that is proving such a challenge to resource management. Urbanization is a major driver of GDP growth, but also a significant consumer of scarce water resources. As urbanization continues apace, particularly in Africa and Asia, ever more scarce water resources will place an increasing burden on mankind. On top of that, improving living standards and ongoing industrialization in emerging markets will heap further pressure on global water allocation.

A failure to manage the planet's limited water resources will have huge social and economic costs. The flip-side to this scenario is that if the world can harness its limited water resources, the benefits to mankind will be enormous and translate into a convincing investment case.

Introduction to the Longer Term Investments (LTI) series

- › **The Longer Term Investments (LTI)** series contains thematic investment ideas based on long term structural developments.
- › Secular trends such as population growth, ageing, and increased urbanization create a variety of longer term investment opportunities.
- › Investors willing to invest over multiple business cycles can benefit from potential mispricings created by the typically shorter term focus of stock markets.



Urbanization and population growth: Water demand rises, both in magnitude and complexity

This report discusses the "expanded water nexus," which captures the inter-relationships between the main water consumers and demonstrates the critical linkage played by water. Although the water cycle is a closed system and our blue planet seems to offer it in abundance, suitable water supply is scarce and unevenly distributed. The direct and indirect effects of water scarcity can be seen through current events such as mass migration, civil conflicts and drought. Contrasting global water demand with global water supply shows that water scarcity is a real threat, not just a potential one (Fig. 1). Research suggests that water scarcity poses a threat to two-thirds of the world's population, a number far higher than previously suggested (Mekonnen & Hoekstra, 2016).

Population growth: Direct and indirect effects on water demand

A larger population raises overall consumption and thereby increases demand for water. By 2025, the UN estimates that the world's population will reach eight billion people, and nearly 10 billion by 2050. The obvious direct effect is a higher demand for drinking water, but the indirect effect (food production) is an even bigger challenge. The ever-larger population will also need sufficient caloric intake. Not only higher quantities, but changing dietary preferences will impact demand for water. Agriculture currently accounts for 70% of global fresh water demand. Protein-rich nutrition based on animal products will further increase water demand. The Swiss Federal Institute of Aquatic Science and Technology (EAWAG, A. Zehnder et al) compared a pure vegetarian diet with one that includes meat consumption. Due to different levels of water consumption in the production of meat and cereals (Fig. 2), a diet containing 20% meat almost triples the amount of water usage by an individual to 1,000-1,300 cubic meters per year. Higher living standards not only alter dietary standards, but also increase the "personal water bill" through higher demand for personal hygiene and other types of cleaning.

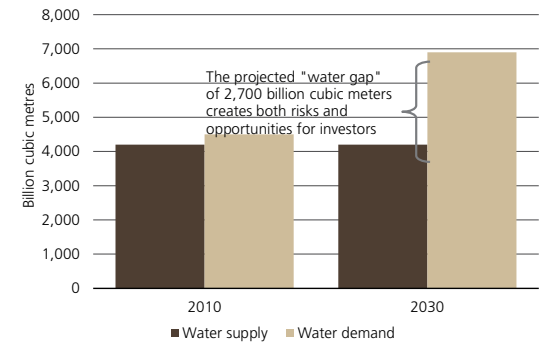
Combining these population growth-driven trends, we expect significant increases in water demand stemming from direct and indirect sources.

Urbanization: A growing thirst for water and energy

In 1950, just 29% of the world's population lived in urban areas. By 2008, the world's urban population exceeded its rural population. The UN expects this trend to continue, with nearly 70% of the world's population living in cities or urban settings by 2050 (see Fig. 3). While the population in most developed countries was concentrated in urban areas from the mid-20th century, emerging markets still have catch-up potential.

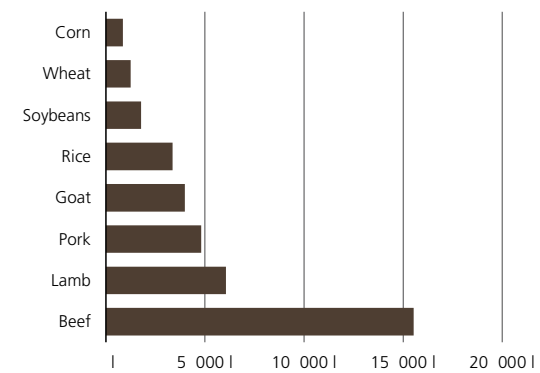
In our view, this trend towards urbanization will create major challenges, but also investment opportunities when it comes to water exploration, treatment and distribution. Most industrialized countries

Fig. 1: Water demand already outstrips supply
Inaction causes an increasing gap



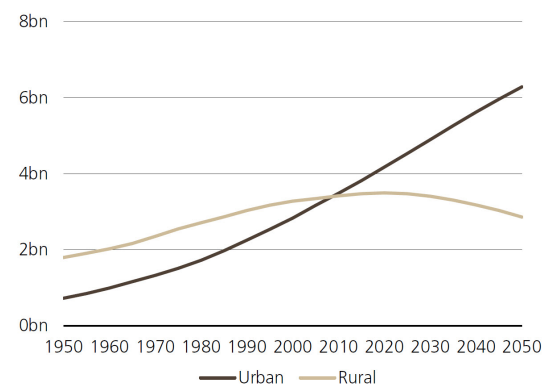
Source: 2030 Water Resources Group (Charting our Water Future), as of November 2009

Fig. 2: Water quantities used in food production
Liters of water needed to produce 1 kg of the food item specified



Source: UNESCO, UBS

Fig. 3: Urban and rural populations
1950-2050E



Source: United Nations, Population Division – World Population Prospects, the 2012 & 2014 Revisions; E= estimate

built their water mains in the early part of the 20th century, but have kept replacement investment low since then. The results of this can be seen in many large cities. New York is an example, where some of the city's water mains date back to 1910. On average across the world, countries lose some 28% of their water through pipe leakage, theft and inappropriate distribution (Northeast Group, 2016).

Kingdom, Liemberger and Marin discovered that many cities lose more water through leakage than they deliver to households. This non-revenue water (NRW) diminishes cities' ability to distribute fresh water in an efficient and economically sound manner.

Limited public budgets illustrate why the private sector will play a much more important role than it has in the past. Increasing tariffs, taxes and transfers can be used for compensation. In our view, this could be a profitable business for many companies. Although it is commonly recognized that water scarcity is an issue that requires urgent attention, the price of water in many countries does not reflect this case. We believe that the price of water will rise, since demand for the resource is inelastic and water scarcity is an increasing risk factor for several countries, sectors and many companies.

Urban industrialization

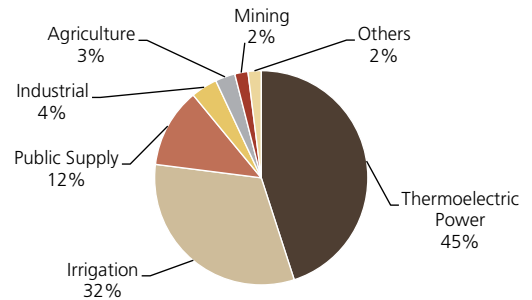
Additional water demand stems not only from a growing urban population, but also the increasing size and number of industrial parks. Most emerging markets are pursuing a strategy of industrialization which accounts for their disproportionately higher use of fresh water. Aside from the electricity sector, which we discuss later, other industry groups in the value chain also have significant water needs, either direct or indirect.

In emerging markets, the challenge is completely different compared to developed markets (DM), but no less severe. Many countries have to build completely new infrastructure whereas developed markets need to repair their existing infrastructure. New water infrastructure costs on average three times more than new electricity infrastructure, based on IBM estimates. Compared to developed markets, where many governments have postponed big investments in water infrastructure for decades, emerging markets have little choice: they must invest. Consequently, we see the biggest opportunity in emerging markets. Around two-thirds of the cities with a population in excess of one million people can be found in Asia, Latin America and Africa. An extreme example is Kinshasa in the Democratic Republic of the Congo, which had a population of less than four million in 1990. This had increased to 11 million in 2014 and is projected to have 20 million people by 2030 according to the United Nations (World Urbanization Prospects 2014 revision).

Thirsty utilities

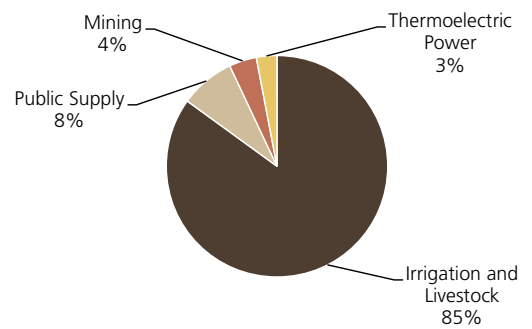
Another result of urbanization and industrialization is the growing energy thirst from big cities. Most types of electricity generation consume water during the generation phase (see Fig. 4).

Fig. 4: Water withdrawals by industry in the US



Source: US Geological Survey

Fig. 5: Water consumption usage by industry in the US



Source: US Geological Survey

Large thermal power plants in particular require significant amounts of water for their cooling operations. China, for example, depends heavily on this type of power plant. The amount of water used is significant, however, thermoelectric utilities are not regarded as big consumers of water as they return water back into the hydrological cycle (see Fig. 5). Compare that to water used for irrigation or livestock, where much of the water used is incorporated into the end-product. Nevertheless, as thermoelectric utilities need water for their cooling operations, they stand in direct competition with other users, such as the agriculture sector and other industries, and therefore this may impact their investment case.

Climate change: Effects on water supply and GDP

Recent events in the US (see Box 1) highlight that water scarcity is not limited to emerging markets (EM). That said, it is in the emerging economies that water scarcity is most keenly felt, particularly those EM countries that are highly dependent on water to drive GDP growth (e.g. those with a significant agricultural sector) face severe shortages. In emerging markets, population growth, industrialization and the convergence of living standards towards the Western world have already taken their toll on water demand. This situation may escalate according to the latest research targeting the effects of climate change on water and the economy. The emergence of adverse effects triggered by a rising global temperature are highly uneven, yet predominantly hit the already stressed developing countries.

Water cycle as the primary channel of climate-driven changes

Global climate models indicate that a change in average global temperature has a significant impact on the hydrological cycle. As the amount of surface water in the world is static (because it is a closed-water system), climate-driven changes are seen mainly through the allocation, availability and quality of water.

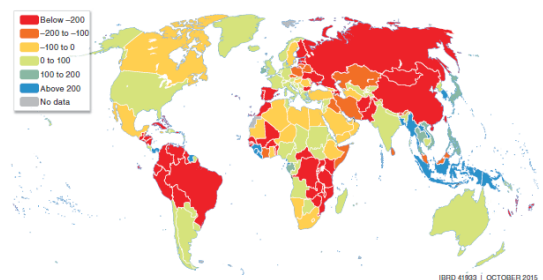
On the one hand, the frequency and uncertainty of floods, storms, droughts and extreme rainfall clearly impact the planet's water system. On the other hand, the spatial distribution of runoff is a major concern. According to the World Bank's latest findings, climate-driven changes in runoff will have a highly uneven impact around the world with those areas already suffering from water shortages likely to be hit hardest (Fig. 6). This means that the least developed countries, where water-consuming activities such as agriculture and energy generation are particularly important, are most likely to suffer the greatest.

Groundwater is also affected by climate change. On the one hand, changed recharge patterns caused by climate-driven events directly affect groundwater reservoirs. On the other hand, reduced runoff increases groundwater demand, especially through irrigation, which is responsible for 70% of global groundwater withdrawals (WWAP, 2012).

Box 1: California's drought and Flint's out-dated infrastructure – the US is facing severe water challenges

California is the most populous state and the agricultural powerhouse of the US. With precipitation not only limited, but also highly variable, California suffers a near constant water supply/demand mismatch. Although this problem is well recognized, investments in water infrastructure have fallen short of requirements, despite a doubling of the population since 1979. Postponed investments to increase reservoirs, as well as addressing water leakage issues, are now taking their toll. The drought that started in 2012 is finally abating after five years. In February this year, rain and melt-water were starting to replenish the state's reservoirs. California exemplifies the need to manage water supply holistically, and offers business opportunities for water-exposed companies. Investments in dams, desalination plants and leaking pipe systems have to be complemented by the implementation of smart utilities, as water conservation represents the cheapest way of fighting scarcity. Disclosures in January 2016 that Flint, Michigan was suffering a water management crisis, further accentuated the urgent need for investment. The tap-water scandal, caused by lead-contaminated water, saw President Barack Obama drinking a glass of Flint's tap water in a symbolic gesture to restore trust. As more than 12,000 children were exposed to high levels of lead, the potential health issues were clearly evident. Many cities in the US rely on corroded, outdated water pipe systems.

Fig. 6: Climate-driven reductions in runoff* till 2050; reduced runoff hits least developed and agriculture dependent countries the most
Projected reduction in millimeter per square meter



Source: World Bank (High and dry: Climate change, water, and the economy) as of 2016

* **definition runoff:** Part of water cycle that flows over land as surface water instead of being absorbed into the groundwater. This is an important and easily accessible water source for man, animals and the agricultural sector in particular in the least developed regions worldwide.

Besides water levels, aquifer water quality is also at risk from global warming. Increased groundwater salinity caused by higher temperatures and increased sea levels is one of the main concerns. Rising sea levels push seawater inland and increased temperatures cause a significant amount of runoff to evaporate before it is able to replenish groundwater reservoirs.

Water's important role in global GDP growth

Figure 7 shows the "Water-Climate Nexus" and expands on previous ideas by incorporating environmental and urbanization trends into the equation (World Bank, 2016). This concept shows that the competition for water from the agriculture and the energy sectors will intensify further through urban and environmental trends.

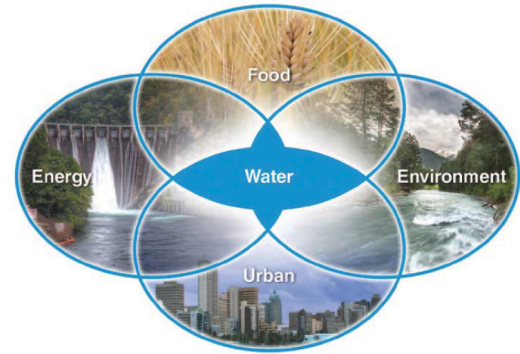
It is possible to identify three main ways in which water impacts prosperity. First, the rise in frequency and intensity of droughts, floods and other catastrophic events can have serious economic consequences. We believe investments in infrastructure and smart warning systems could yield high returns, both socially and economically.

Second, whether it is as a direct or indirect input into the production process, water must be distributed efficiently in order to keep businesses and economies running. Examples where insufficient water supply has affected companies' operational business processes can be found on a global scale. Ultimately this leads to lower GDP growth. As widely mentioned in the media, whether in India (NTPC & Infosys), Brazil (EDP), the US (Starbucks) or Australia (GrainCorp), drought and water shortages have forced companies from different sectors to shut down or relocate production processes.

Finally, water-related issues have indirect long-term effects on health, nutrition, education and human capital. As a consequence, poverty, economic stagnation and the lack of employment prospects can cause social tension and conflict. In a globalized world, such conflicts can spill across borders. Mass migration is a major challenge, and is to a high extent driven by water scarcity. These developments will be further exacerbated by the uneven impact of climate change, focused on the least developed regions, from where a large proportion of refugees emanate. This tide of refugees is likely to continue unless living conditions in their home countries improve. As access to fresh water is a building block in this process, inaction could slow global GDP growth significantly (Fig. 8). Many of the economic migrants coming to Europe are doing so, in part, because of food and water scarcity they face in their home countries.

Fig. 7: The water-climate nexus

Water scarcity has far reaching consequences for different sectors



Source: World Bank (High and dry: Climate change, water, and the economy) as of 2016

Fig. 8: Climate-driven water scarcity has a strong negative impact on GDP in year 2050

In the "business as usual policy regime" regions in North Africa and Asia could see a significantly lower GDP in the year 2050.



Source: World Bank (High and dry: Climate change, water, and the economy) as of 2016. The chart shows the business as usual scenario.

Other factors supporting our "Water Scarcity" theme

Ballast water treatment

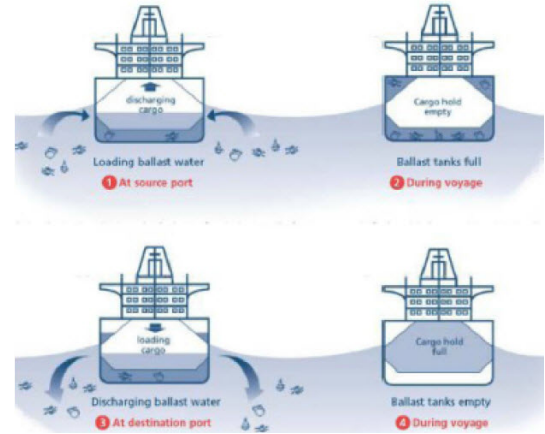
While the aforementioned trends are long-term in nature, we see some short-term drivers that support our investment theme. Ballast-water treatment falls into this category. Ballast water is water that cargo vessels take on to balance their weight and improve their maneuverability (see Fig. 9). Intake at the source port often includes bacteria, algae and sea organisms that are eventually released at the destination harbor, which can harm the biodiversity in the local environment. This problem has worsened in recent years and has triggered legislative action. In our last publication (May 2016) we highlighted that 49 contracting partners, representing 34.79% of the world's tonnage had signed the BWM Convention of the International Maritime Organization. The 35% threshold was passed in September last year, which means that the regulation will come into force in September this year. This means that ballast water-treatment systems will become mandatory within the marine shipping industry, prompting significant spending on modernizing vessels over the next five years (mandatory installation period). We estimate that around 30,000 ships globally need to be fitted with ballast water-treatment systems (25,000 retrofit + rest new builds) with average costs of more than EUR 500,000 per ship (around EUR 100,000 for smaller ships and up to EUR 1,000,000 for larger ships, all UBS estimates). In sum, this would result in more than EUR 15bn of investment over the next five years. We estimate that last year 500-600 ballast water treatment systems were installed (only in new build ships), assuming that our theoretical 30,000 estimate is correct, the potential growth is significant.

European Investment Bank: Largest lender to global water sector

A number of global institutions, including the World Bank and the World Economic Forum, are discussing the topic of water scarcity. The European Investment Bank (EIB) for instance, has sharpened its focus on water investments. Based on its own assessment, the bank is the largest lender to the global water sector. In total, the EIB has supported around 1,400 projects with a total loan value of nearly EUR 64bn, including EUR 4bn in 2015, providing 21 million people with access to clean water and 20 million to waste water treatment. An example of their work can be seen in Lisbon where, through a series of projects, the city reduced the amount of non-revenue generating water by 70% over eight years (19 million cubic meters of water saved per day). Besides the provision of credit, the EIB also supported the implementation of smart and innovative technologies to achieve this target. In tandem, the European Fund for Strategic Investments, the EIB and the European Commission have set up a funding vehicle for sustainable infrastructure projects. Water-related investments are an important part of that strategy.

Fig. 9: Ballast water – legislation pending

Graphic representation of the ballast water cycle



Source: International Maritime Organization, UBS

Market make-up

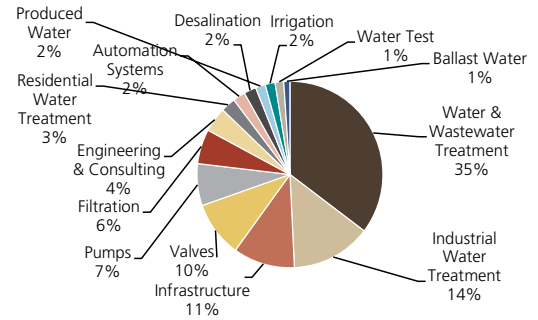
The market for water does not fall into a single sector, rather comprises several subsectors and industries that can broadly be split into two groups: industrials and water utilities. Based on several market estimates and our own analysis, we estimate that the entire water market is worth around USD 600bn annually. Figure 10 shows each subsector's percentage of the total addressable market. The biggest category, with 35%, is wastewater treatment (water utilities), and the remaining 65% is mainly attributable to water equipment suppliers that provide equipment for water exploration, distribution and treatment. Broadly speaking, one can categorize the water utility sector as infrastructure users and spenders (demand-side for equipment) and the industrial equipment providers as the beneficiaries of these investments (supply-side for equipment). New trends, like ballast water treatment, are currently still niche markets, independent of infrastructure and water utility spending, but offer a regulatory opportunity. After the positive regulatory developments in the ballast-water treatment industry, we believe this segment should see the highest growth rates over the next several years (for more details see the section about ballast water treatment), followed by desalination (>10% p.a.). The slowest growing subsectors are filtration, pumps, valves, and water infrastructure, which are expected to grow at lower mid-single-digit growth rates (2-4% p.a.). In contrast, the water utility sector (water and wastewater treatment) is expected to grow at a mid-to-high single-digit rate. Strong growth in emerging markets supports these trends.

In our view, both water utilities and industrials should benefit from rising water demand, mainly through more equipment sales for industrials and higher investments and rising water tariffs for utilities. It may sound counterintuitive to suggest that more investments will bring larger profits, but UK water utilities, for instance, earn their money through a regulated return on investments, based on their existing asset base and future investments (i.e. more investments equals more opportunity to generate profits).

This means that as investments increase, the revenue base can grow, leading to a potential increase in profits. Elsewhere, many Chinese water utilities hold concessions to operate water plants over 25- to 30-year periods. Tap water operators can benefit from rising water prices (i.e. their margins can improve). China has seen strong water tariff increases, nevertheless Beijing's tariff (which is high compared to other Chinese cities due to water shortage) remains 51% below Japan's level (Beijing charges through a tier-pricing system based on annual usage), 72% below some US cities (e.g. Los Angeles) and up to 62% below the UK's water tariff (source: Beijing, Tokyo water authorities, Los Angeles city water board, Anglian company website). This suggests that Chinese utilities have room to grow their margins.

Fig. 10: Global water subsectors

The water sector consists of multiple sub-sectors, each with different drivers



Source: RBC Capital Markets as of 24 November 2014 (Playbook for Investing in the Multi-Industry & Electrical Equipment Sector). RBC has based its estimates on a water market size of at least USD 450bn in 2014 with an expected long-term growth rate of about 4% to 6% annually.

The attractive business prospects and high revenue visibility of water utilities (local monopolies) and the well diversified business set-up of the water-exposed industrial companies are the main reasons why we believe that investors should include both water-exposed industrials and water utilities in their portfolios. Based on Bloomberg data, the S&P Global Water Index has outperformed the broader MSCI World Index by 24% over the last decade (see Fig. 11).

Link to Sustainable Investing

To identify whether a Longer Term Investment (LTI) theme qualifies as a sustainable investment (SI) theme, we follow a two-step process. The first step is a top-down analysis. LTIs are assessed according to whether they match one or more of the sustainability topics within the environmental, social or governance (ESG) categories (see Fig. 12). In general, these themes must contribute to environmental sustainability (e.g. a low-carbon economy), resource efficiency (e.g. energy, water), a sustainable society (e.g. health, education, poverty reduction, equality and social inclusion, etc.) or sustainable corporate governance.

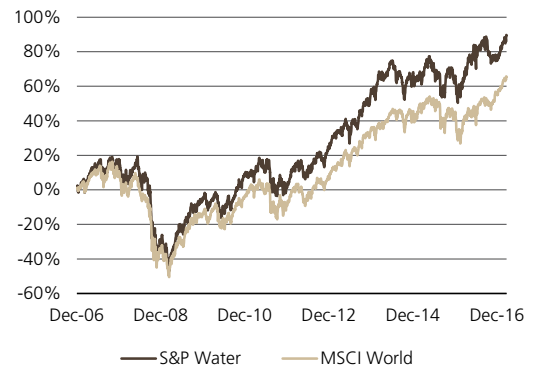
The second step is a bottom-up analysis that considers a thematically aligned representative universe of companies, a large majority of which (80% or more) must align with one or more of the ESG categories. For each individual company, a minimum business involvement threshold is applied, e.g. 25% of revenues must come from the thematic activity under consideration.

The World Economic Forum has recognized water scarcity as one of the most critical risks facing our planet. An inadequate supply of water threatens the viability of the global economy, the environment and human life. Water is a life-sustaining resource with no substitute. In the context of the ESG sustainable investing framework, our Water Scarcity investment theme covers the "E" environmental and "S" social parts, addressing in particular environmental sustainability and resource efficiency. In our view, numerous developments can provide investors with long-term investment opportunities in water. We believe these developments will remain valid over the next several decades and lead to sustainable outperformance of the water theme.

Along with the question as to whether our water scarcity theme constitute an SI theme, as defined by our two-step process, investors may wish to consider whether the companies with high exposure to this topic have a solid ESG profile. This analysis is based on MSCI ESG Research ratings that rank companies between AAA (best) and CCC (worst), taking into account various ESG factors.

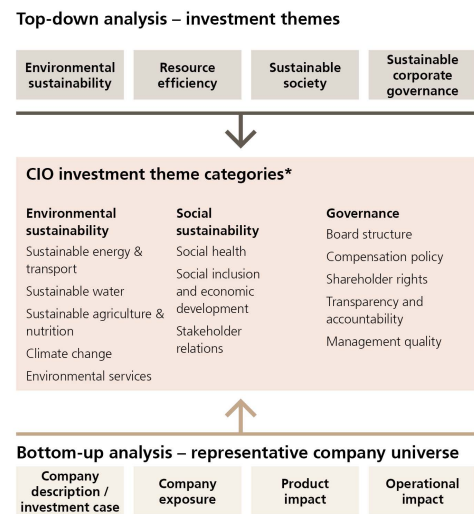
The assessment encompasses the three ESG pillars, each of which has sub-categories. In the case of the environment they are: climate change, natural resources, pollution and waste, and environmental opportunities; in the social sphere: human capital, product liability, stakeholder opposition and social opportunities; and for governance: corporate governance.

Fig. 11: S&P Global Water vs. MSCI World
December 2006 - March 2017, both in USD



Source: Bloomberg as of 21 March 2017, UBS

Fig. 12: Overview of LTI topic clusters



* For simplicity, all topic clusters include several subcategories not included in the graph. For example: sustainable water includes water utilities, treatment, desalination, infrastructure & technology, water efficiency and ballast-water treatment. Within each subcategory are further specifications; e.g. water treatment includes filtration, purification and waste treatment. In total, we have more than 100 categories (potential sustainable investment themes) in our thematic database.

Source: UBS

The research also identifies 37 key ESG issues. To mention one example, under climate change, companies are assessed based on their carbon emissions, energy efficiency and product carbon footprint.

Investors focused on SI should be selective when investing in this theme as several listed companies show below-average ESG results. And as with all investment decisions, diversification and stock selection are important when investing through a cycle.

Water and the Sustainable Development Goals

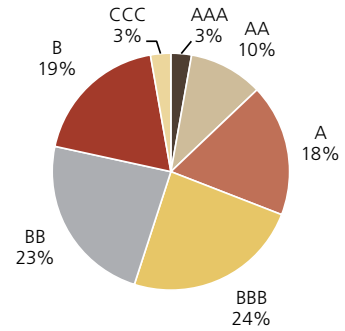
Goal 6 of the UN Sustainable Development Goals (SDGs) is to “ensure availability and sustainable management of water and sanitation for all.” Achieving Goal 6 is critical to maintain biodiversity, reducing the burden of disease, increasing food security and improving human productivity. In short, achieving universal access to clean drinking water and sanitation underpins almost every other goal in the Sustainable Development Agenda.

With demand for water expected to significantly overshoot supply by 2030 (see Fig. 1), investing in water has become a particularly attractive solution for impact investors.

- Nearly 1 billion people lack access to safe drinking water globally. Investing in water infrastructure and affordable water purification solutions could go a long way towards enabling access to clean drinking water in developing countries. With low-income populations accounting for roughly USD 5trn in annual spending globally (source: World Resource Institute 2016), providing access to affordable drinking water is also a significant, unmet market opportunity.
- Water Sharing Investment Partnerships (WSIP) can help ease water scarcity in stressed regions while conserving and restoring water ecosystems. WSIPs use investor capital to acquire water rights, which are then leased to the market or diverted back to the environment. WSIPs are prominent in countries like the United States, where water rights are actively traded.
- Agriculture accounts for roughly 70 percent of all freshwater usage globally. As dry regions become dryer due to climate change, water scarcity could exacerbate global food shortages. Investing in smart irrigation technologies has the potential to reduce inefficient water usage and improve food security, particularly in arid regions like Sub-Saharan Africa.
- Wastewater reuse currently accounts for just under three percent of all freshwater withdrawals globally, compared to best practice of over 75 percent (for more details please see our "Water scarcity - update" published on 21 July 2015). Investing in water recycling technologies and infrastructure will prove critical to preserving existing groundwater resources. This is particularly true in population-dense, water-scarce countries like China, India or parts of Brazil.

Fig. 13: Entire MSCI ESG Research corporate coverage

Rating distribution in %, 5,720 companies



Note:AAA = best possible ESG rating;CCC = worst.
Source:MSCI ESG Research, UBS, as of 23 February 2017

Investing in this theme provides not just an opportunity to make a meaningful contribution to solving the global water crisis, but also the potential for financial returns making it an attractive theme for impact investors. Dedicated but smaller-scale impact investing solutions exist for investors looking to invest in this theme, primarily in private equity and venture capital funds. It is important to note, however, that most of these funds target concessionary returns. Impact investors targeting market-rates of return may therefore be better off accessing this theme through generalist private equity and venture funds or via direct investments. When investing using non-impact-specific vehicles, impact investors must assess whether individual investments meet impact criteria including intent, measurability, verification and additionality (additionality = proof that impact would not have occurred had your organization not made this investment).

Andrew Lee, Head Impact Investing and Private Markets
James Gifford, Senior Impact Investing Strategist
Nicole Neghaiwi, Impact Investing Analyst

Conclusion

As outlined in this report, the trends impacting the rising supply-demand mismatch for water are numerous and diverse. However, despite the common denominator of water exposure, the bulk of them can be subsumed under two structural trends: population growth and urbanization. We also highlighted that water-related investments are in the spotlight in emerging market countries as well as developed market countries.

Owing to the urgency and scale of water-related issues, we see sustainable and continuous revenue and profit growth prospects for exposed companies. In light of the global scale of the water scarcity problem and the diversity of the underlying developments, we recommend investing in a well-diversified investment vehicle encompassing both industrials and utilities, thereby ensuring reasonable exposure to all key trends.

While the various trends grow mostly at different rates and also have differing market potential, as outlined above, taken together we believe that they should make an important contribution to a market growing at mid-single-digit growth rates, with an overall current global market size amounting to around USD 600bn, based on our estimates.

Because of the large number of factors involved and the long-term investment horizon, we advise investing in a well-diversified investment vehicle that offers global exposure to the entire water value chain.

Risks

One of the main risks to our water-related theme, and one that we have flagged over the past two years, has materialized. The sharp drop in oil prices and with it correspondingly lower capital expenditure (capex) has had a negative impact on some water equipment companies with exposure to this sector. Pentair, one of the heavyweights in the global S&P Water Index, estimates that about 20% of its sales are to the oil and gas sector. Therefore, a renewed decline in oil and gas capex clearly poses a risk to our positive view on the investment theme in the short term.

Municipalities' investment activity is also linked to our investment theme. Despite currently unsustainable reinvestment cycles in developed markets (see New York example, where some of the city's 's water mains date back to 1910), municipalities can attempt to postpone much needed investments. In this context, so-called private-public partnerships come into play, in which private companies assume a certain degree of operational and financial risk, while joining the public sector in providing public services. Since the financial market crisis, we have observed a strong increase in total investments. However, the participation of the private sector depends heavily on the lending capacities of the capital markets and banks. With the latter in particular hampered somewhat after the last banking crisis, we acknowledge this as a source of risk.

Another risk stems from any potential water-related policy changes that could harm the operating environment (regulations and tariffs) in regions like Europe, the US or China. Such changes can affect the water utility sector in particular, which is highly dependent on policy action. Equipment providers would also be hurt indirectly, if utilities reduced their respective infrastructure investment due to a lack of profitability. We follow the water sector closely and try to anticipate changes, but we cannot exclude sudden policy changes as a risk to our positive long-term stance on the sector.

Finally, the water investment theme is less cyclical, but not non-cyclical given its exposure to the industrials sector, which is subject to economic cycles. Therefore, our projected long-term outperformance relative to the broader market (see conclusion) is projected over the cycle and might deviate within an economic cycle.

Appendix

Terms and Abbreviations

Term / Abbreviation	Description / Definition	Term / Abbreviation	Description / Definition
2011E, 2012E, etc.	2011 estimate, 2012 estimate, etc.	A	actual i.e. 2010A
Capex	Capital expenditures	COM	Common shares
E	expected i.e. 2011E	GDP	Gross domestic product
p.a.	Per annum (per year)	Shares o/s	Shares outstanding
UP	Underperform: The stock is expected to underperform the sector benchmark	CIO	UBS WM Chief Investment Office

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