UBS

Longer Term Investments

Water scarcity – special focus on Cape Town

Chief Investment Office Americas, Wealth Management | **20 February 2018** 3:48 pm GMT
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- South Africa (the Western Cape) is suffering a drastic water shortage after a three-year drought. Day Zero, the day when the government shuts off water supply in Cape Town, is approaching soon. The water shortage has a negative economic as well as social impact.
- Cape Town highlights the importance of a functioning water infrastructure, prevention of water wastage (leakage) and efficient use of water. We believe there are long-term investment opportunities in water; these 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.

Source: istock

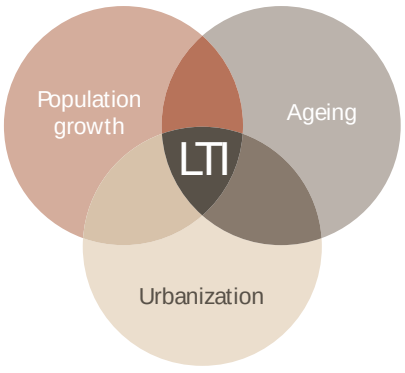
Our view

Since 1 February, Capetonians have been asked to limit their daily water usage to 50l per capita per day, down from 87l as of 1 July 2017, and more than 200l average usage over the last 20 years. The levels of major dams are extremely low (current storage level is just 24.7%), soon triggering the next escalation level. As soon as the dam storage falls below 13.5%, Cape Town will close off water valves in most districts and restrict daily water supply to 25l per person. The amount is close to the required level defined for short-term survival by the WHO (20l per day). Currently, Day Zero is projected on 11 May 2018. Cape Town is just the latest sad example and representative of what we've highlighted in our research for the last several years. Insufficient water infrastructure (stronger urbanization than infrastructure investments), changing rainfall patterns (climate change) and inefficient use of available resources can result in major water crises directly affecting the population and economy.

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 scarcer water resources will burden mankind the more. 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

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.



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.

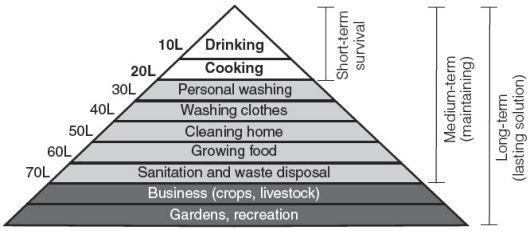
Day Zero soon approaching

Following a three-year drought, Cape Town is counting the days until it is forced to turn off the taps. The reasons are manifold, but nothing new compared to many other water crises. Cape Town is South Africa's second-largest city after Johannesburg. The city's population grew more than 2% p.a. since 1990, and is now estimated at 3,957,798 (mid-year estimate 2015, statistics South Africa). Similar to other booming emerging market (EM) cities, the available resources and investments in water infrastructure weren't able to keep up with the growing population. Based on a Reuters report, the likelihood of such an event (three-year drought) was estimated at 0.1% in the year 2014 (source: In drought-hit South Africa, the politics of water, Reuters published on 5 February 2018).

The local government has already been aiming for several years to reduce the water consumption to 180l per capita per day by 2014 but failed its target. The average consumption was always more than 200l per capita per day over the last two decades. One solution is to reduce water leakage, although Cape Town, notably, already has relatively low leakage with only 10% (data from 2009) compared to other major cities (see previous water reports where we discussed this topic). Since 1 February, a new 50l target is implemented for residents, and for non-residential users a reduction by 45% compared to the level used in 2015. If water resources drop further, residents will only get 25l per day (current estimate 11 May), close to the WHO's minimum water requirements (see Fig. 1). Fig. 2 depicts the severity of the situation. The picture shows parts of the Theewaterskloof Dam in February 2018. According to the website of the Department of Water and Sanitation of the South African government, this is the largest dam in the Western Cape Water Supply System, and represents around 50% of the water storage capacity of dams available to Cape Town (at the time of writing the current dam level of Theewaterskloof is just 11.4% of full capacity).

The negative effects of this regulation are calculable. On Day Zero, Cape Town's population will have access to only 200 distribution points. Roughly calculated, each distribution point needs to provide water to around 19,789 people. The city is preparing them outside of grocery stores or gathering spots. Dividing this figure by 24h means 825 people would get their water per hour, or almost 14 per minute. Chaos appears programmed; imaginably, police or army support to guarantee equal distribution may be needed.

Fig. 1: Hierarchy of water requirements



Source: World Health Organization (Technical notes on drinking-water, sanitation and hygiene in emergencies, July 2013)

Fig. 2: Theewaterskloof Dam water levels, February 2018

Source: Gettyimages

Alongside this negative social impact, the economic impact could be material. Based on the city of Cape Town Economic Performance Indicators Quarter 2 (2016), the Western Cape region generates 13.82% of South Africa's GDP. Cape Town alone represents 9.9% of GDP (only Johannesburg surpasses it with 15.39%). In Cape Town, the financial industry is the most important sector with 35.5% of gross value added (GVA, 2016 data), but the city is also home to more water-intensive sectors like agriculture (0.6% of GVA) or manufacturing (13.3% of GVA). These sectors will likely be impacted; if this situation continues, job losses could result.

It's not only South Africa

Cape Town is just one example of a situation that will worsen in the future. MIT research paints a bleak picture for many Asian countries (source: Projections of water stress based on an ensemble of socioeconomic growth and climate change scenarios: a case study in Asia, published on 30 March 2016, Massachusetts Institute of Technology). The analysis differentiates between climate change-driven issues and socioeconomic drivers to understand the primary driver of water scarcity. The results show that several Asian countries will be impacted by climate-driven changes, in particular Northern China, Pakistan and Afghanistan. On the other side, socioeconomic drivers (e.g. change in consumption such as requirements in agriculture, industry and municipality water needs) will impact India, mainland Asia and also China. Researchers found a high risk of severe water stress in densely populated regions. The analysis confirms our conclusion of previous reports that generally people are moving to places where water is already scarce, in cities, highlighting that urbanization – one of our three Longer Term Investment theme drivers – is an important driver behind water scarcity.

Looking from Asia to Latin America, we see similar developments. In Bolivia in spring 2000, for instance, protests against privatization of water services in the city Cochabamba resulted in a water crisis known as "the first water war of the 21st century" (one person died and several were injured). Since then, the country has experienced the worst drought since 25 years, affecting tens of thousands across the country. Two important dams supplying water to La Paz operated at just 5% of capacity (Inkachaka Dam) and at 1% of capacity (Ajunkota Dam) in late 2016. After more than half of Bolivia's municipalities declared emergency related to the drought, the government itself declared a state of emergency. According to several reports, the roots of the drought are a combination of poor water management, climate change and the El Nino weather cycle. According to the United Nations, Bolivia lost at least 40% of its glaciers in just two decades.

In sum, Cape Town is the latest example showing that governments need to invest in better water infrastructure and use available resources more efficiently to prevent recurrent crises.

Conclusion

Demand is constantly growing while supply is limited. Long-term developments such as population growth, urbanization, higher living standards, industrialization in emerging markets, lack of infrastructure, and climate change constrict the water supply-and-demand situation. Each trend influences the water sub-sectors in different ways, and we therefore expect tremendous growth potential. We estimate that the global water market is currently worth more than USD 600bn annually. The biggest category, with 35%, is wastewater treatment (water utilities), and the remaining 65% is mainly attributable to water equipment suppliers providing 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 (for details on ballast water treatment see our report about Water scarcity published on 5 April 2017). The longer-term growth outlook is compelling, because we expect water demand to overshoot supply in the next decades, requiring additional water equipment investments. We expect our water theme to outperform the MSCI World over the economic cycle. Keeping in mind that the outlined trends are long-term in nature, and assuming no sudden interruption, we recommend building up well-diversified exposure to this structural story, now.

Risks

The water investment theme is less cyclical (high exposure to the utility sector), but is 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 is projected over the cycle and might deviate within an economic cycle.

Municipalities' investment activity is also linked to our investment theme. Despite currently unsustainable reinvestment cycles in developed and developing markets (see Cape Town example), 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 recovery in total investments. However, the participation of the private sector depends heavily on the lending capacities of the capital markets and banks. Any uncertainty could lead to lower investment, so we perceive this as a source of risk.

Finally, 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.

Appendix

Terms and Abbreviations

Term / Abbreviation	Description / Definition	Term / Abbreviation	Description / Definition
A	actual i.e. 2010A	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