

Thinking Thematically

Water, water everywhere – and not a drop to drink



Rene Reyna, CFP®

Head of Thematic & Specialty Product Strategy,
ETF & Indexed Strategies



Brett Boor, CFA

Director, Thematic Research
ETF & Indexed Strategies

Overview

- With growing demand and falling supply, the water system remains under threat
- Water technology could play a role in improving our efficiency and preserving the supply we have
- Water ‘moonshots’ may be the next step, however, to combating supply challenges

1. World Health Organization, 2016. Most Recent Data Available

2. American Society of Civil Engineers, 2021

3. Statista, December 2023

4. Bank of America, November 2023

5. McKinsey, May 2020

6. Reuters, November 2023

7. BBC, August 2022

8. CBC, August 2022 & Reuters, May 2023

9. Earth.org, March 2023

10. Wells Fargo, December 2023

In many ways, water is a victim of its own success. Since the 1850s, the global water system has only gotten better. Gone are the days of sewage filling the streets, of mass cholera outbreaks and the Great Stink of London. Starting with the London Metropolis Water Act of 1852, requiring the filtration of all public water, we finally began to claw back a millennia of backsliding, attempting to return to the days of the Roman aqueduct¹.

In many ways, we succeeded. In much of the developed world, you can turn on any tap and safely drink the water. In the US, the water network runs 2.2 million miles (3.5 million kilometers)², which is nothing compared to Europe, with 1.9 million kilometers (1.2 million miles) between France, Germany, and Italy alone³. Unfortunately, that ease has made water an abstraction for many, like electricity, something we use without thinking – and we’re using it far too quickly.

Water demand is up 40% over the last four decades while the supply has halved⁴. Water use is the common thread in everything we do, with 70% going to agriculture and 19% to industry⁵. Even our most cutting-edge technologies require water, with semiconductors requiring ultra-purified water and Chat-GPT gulping a liter to cool its servers every 40 commands⁴.

Given its vital importance, water is one of the spaces we follow most closely. Today, we’ll take you through where we are, where we’re headed, and some of the technologies that could help us get there.

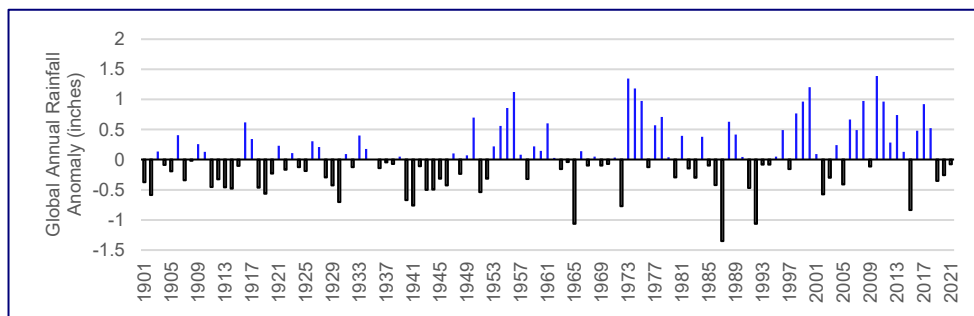
The state of water supply

The global water system is facing many threats. Chief among them, of course, is climate change. We’ve just lived through the hottest 12 months in 125,000 years of geologic history, and its mark on the water system – through drought on one end and flooding on the other – is all too clear⁶. In Europe, the summer of 2022 saw unprecedented drought along the Danube, with water levels falling far enough to reveal shipwrecks and ammunition from World War II⁷. Asia has seen similar challenges, with powerful droughts in China causing blackouts in 2022 from dried up hydroelectric dams, while heavy monsoon rains in India in 2023 hit agriculture and food prices⁸.

That’s not the only problem, either. Of the vanishingly small amount of fresh water – less than 1% of our water is usable despite 75% of the planet being covered in it⁴ – growing amounts are also threatened by pollution, with 90% of groundwater in China, for example, deemed contaminated⁹.

The vast infrastructure we’ve built out for water supply also needs work. Aging pipes lose 1/3 of all water to leakage⁴, while those same pipes often pose the risk of lead contamination. In the US, the Environmental Protection Agency (EPA) recently passed more stringent rules on lead safety. This could actually be a boon to major utilities, who already have aggressive capital spending plans for lead and PFAS (per- and polyfluoroalkyl substances known as ‘forever chemicals’)¹⁰. But as they scoop up more municipal water projects that lack the capacity to spend on such issues, the landscape is clearly changing¹⁰.

Growing Global Precipitation Anomalies



The role of water technology

While pipes and utilities are still the backbone of water investing, the theme is also much broader than those traditional industries alone. Water technology can alter the way we use the water we have, seeking efficiencies in our systems and the purification of the water we currently have.

Within our current water infrastructure, this can look like better utilization of water data with smart meters and leak detectors, providing 'system visibility' that can improve response times and reduce waste¹¹. In agriculture, there are myriad 'water sense' technologies like soil moisture sensors, targeted irrigation, drones, and even artificial intelligence solutions that could save up to 20% of current irrigation levels¹².

Within waste prevention and decontamination, there has been interest in nanotechnology and the use of nanostructured material to remove pollutants like arsenic from the water supply¹³. In medicine, water pressure tools are being used in surgery, while water quality and testing remain important fields to ensure precision and purity¹⁴.



Water moonshots?

Beyond our current technology, there is also growing interest in 'moonshots' – ambitious projects with new technologies – to start a new age for the water industry. One very science-fiction example is asteroid mining, whereby scientists could extract the ample water on space objects – and maybe even use it on a future Mars colony⁴. Other attempts, however, are more homegrown. Technologies to harvest dew, fog, and even air humidity using solar energy are all possibilities, though we'll need time to test and scale these solutions¹⁵. Desalination is another area ripe for disruption where current energy intensive technologies have made the technology difficult to scale despite an abundance of seawater on our planet¹⁶.

What happens next?

Despite facing plenty of uncertainty in the world of water, one thing is clear – we need to become more ambitious about our water system. The future will need technologies both new and old ranging from pipes and pumps to more farfetched moonshots to boost supply. Water will always be essential to human life, and that's why the scale of the problem requires the best of human innovation. It's been nearly 130 years since we first began chlorinating our water, and I hope the next 130 see us sipping water on the moon.

11. Xylem, December 2023

12. Anjum, Cheema, Hussain, & Wu, June 2023

13. Nagar and Pradeep, April 2023

14. Umamoto, Wang, and Vyas, July 2023

15. Inverse, November 2021

16. Stanford, September 2021

Investment Risks

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested.

The risks of investing in securities of foreign issuers can include fluctuations in foreign currencies, political and economic instability, and foreign taxation issues. The performance of an investment concentrated in issuers of a certain region or country is expected to be closely tied to conditions within that region and to be more volatile than more geographically diversified investments.

Investments focused in a particular industry or sector are subject to greater risk, and are more greatly impacted by market volatility, than more diversified investments.

Important information

This document is intended only for professional investors in Hong Kong, for Institutional Investors and/or Accredited Investors in Singapore, for certain specific sovereign wealth funds and/or Qualified Domestic Institutional Investors approved by local regulators only in the People's Republic of China, for certain specific Qualified Institutions and/or Sophisticated Investors only in Taiwan, for Qualified Professional Investors in Korea, for certain specific institutional investors in Brunei, for Qualified Institutional Investors and/or certain specific institutional investors in Thailand, for certain specific institutional investors in Malaysia upon request, for certain specific institutional investors in Indonesia and for qualified buyers in Philippines for informational purposes only. This document is not an offering of a financial product and should not be distributed to retail clients who are resident in jurisdiction where its distribution is not authorized or is unlawful. Circulation, disclosure, or dissemination of all or any part of this document to any unauthorized person is prohibited.

This document may contain statements that are not purely historical in nature but are "forward-looking statements," which are based on certain assumptions of future events. Forward-looking statements are based on information available on the date hereof, and Invesco does not assume any duty to update any forward-looking statement. Actual events may differ from those assumed. There can be no assurance that forward-looking statements, including any projected returns, will materialize or that actual market conditions and/or performance results will not be materially different or worse than those presented.

All material presented is compiled from sources believed to be reliable and current, but accuracy cannot be guaranteed. Investment involves risk. Please review all financial material carefully before investing. The opinions expressed are based on current market conditions and are subject to change without notice. These opinions may differ from those of other Invesco investment professionals.

The distribution and offering of this document in certain jurisdictions may be restricted by law. Persons into whose possession this marketing material may come are required to inform themselves about and to comply with any relevant restrictions. This does not constitute an offer or solicitation by anyone in any jurisdiction in which such an offer is not authorised or to any person to whom it is unlawful to make such an offer or solicitation.

This document is issued in the following countries:

- in Hong Kong by Invesco Hong Kong Limited 景順投資管理有限公司, 45/F, Jardine House, 1 Connaught Place, Central, Hong Kong.
- in Singapore by Invesco Asset Management Singapore Ltd, 9 Raffles Place, #18-01 Republic Plaza, Singapore 048619.
- in Taiwan by Invesco Taiwan Limited, 22F, No.1, Songzhi Road, Taipei 11047, Taiwan (0800-045-066). **Invesco Taiwan Limited is operated and managed independently.**