

The Four Verticals

A hydrologic view of the water investment universe

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Executive Summary

Water is the defining resource constraint of the 21st century, yet institutional capital remains chronically underweight the sector. Global water and wastewater spending across all verticals approaches \$350 to \$800 billion annually depending on scope of definition, against a financing gap estimated at \$7 trillion through 2030 by the [World Bank](#). Private capital currently contributes less than 2 percent of annual global water investment, while public-sector entities and governments provide nearly 91 percent, leaving a structural opportunity of historic scale for disciplined institutional investors.

Aquivest Global Holdings organizes the investable water universe into four distinct verticals, each reflecting a different position in the hydrologic cycle, a different regulatory regime, and a different risk-return profile: (1) Water Rights, (2) Water Infrastructure, (3) Agricultural Water, and (4) Water Technology. Together, these four verticals constitute a comprehensive and internally coherent taxonomy for navigating a market that has historically been fragmented, illiquid, and non-standardized, and is now entering a period of unprecedented institutionalization.

FRAMEWORK IN ONE LINE

Four verticals. One hydrologic cycle. A \$7 trillion financing gap, less than 2 percent private-capital penetration, and accelerating institutionalization across every layer.

The Global Water Market: Aggregate Context

The global water and wastewater market was valued at approximately \$351 billion in 2024, projected to reach \$602 billion by 2031 at a CAGR of 8.0 percent, per [Cognitive Market Research](#). Other scope-inclusive estimates place total water infrastructure at \$850 billion in 2024 and \$1.2 trillion by 2033 at a CAGR of 6.2 percent, per [Global Water Infrastructure Market data](#). [BCC Research](#) specifically values water and wastewater treatment technologies at \$321 billion in 2024, growing to \$591 billion by 2030 at an 11 percent CAGR.

Across North America alone, [Bluefield Research](#) forecasts cumulative water spend (CAPEX and OPEX) across 16 verticals will exceed \$388 billion between 2024 and 2030, with annual spend rising from \$48 billion to \$62 billion. Globally, the [World Bank](#) has estimated that up to \$7 trillion must be mobilized by 2030. The EU alone requires an estimated €255 billion in additional cumulative expenditure for drinking water and sanitation by 2030, per [OECD and EU Commission estimates](#).

Private Capital Deployment

According to a 2025 survey by [White & Case LLP](#), 30 percent of institutional respondents invested more than \$500 million each into the water sector in 2024, with 15 percent deploying over \$1 billion. Infrastructure funds specifically deployed approximately \$1.3 billion each in 2024, approaching public-sector deployment levels (~\$1.5 billion each). [Global Water Intelligence](#) reported that more than \$1 billion in equity capital was invested in water technology companies in 2024 alone, an all-time high.

Key private capital pools active in water include [Ridgewood Infrastructure](#) (closed \$1.2B Fund II in January 2025), [KKR](#) (Northumbrian Water, Axius Water; exploring £4B Thames Water stake), Blackstone (Geosyntec, Desotec, Legence), Bain Capital (AqueoUS Vets, Harrington, Eleda Group), and Ember Infrastructure (\$395M H2O Innovation, \$500M second green fund).

Why Water Has Been Historically Under-Indexed

Despite its macroeconomic importance and projected growth, water has underperformed in attracting private capital. Several structural factors explain this persistent gap:

- **1. Fragmentation.** The U.S. alone has over 50,000 community water systems, the vast majority small and municipally owned. Off-farm water delivery in the West alone involves roughly 850 irrigation districts, federal water projects, and private companies. *Source: [Bluefield Research](#).*
- **2. Regulatory opacity.** Returns for regulated utilities are determined by state public utility commissions through rate cases. The average authorized ROE for U.S. water utilities runs approximately 9.6 percent, with actual earned ROEs frequently falling below that. *Source: [Economic Liberties](#).*
- **3. Illiquidity.** Water rights in most U.S. states are not electronically traded or price-discovered in real time. Prices range from \$150 per acre-foot for low-priority agricultural rights to over \$8,600 per acre-foot for high-priority municipal rights in Texas alone. *Source: [Texas Tribune Water Market Insider](#).*
- **4. Non-standardization.** No universally accepted valuation methodology, asset-class definition, or disclosure framework exists for water rights or agricultural water assets. This increases due-diligence cost and slows deal velocity.
- **5. Declining development finance.** Water-related investment as a share of development finance dropped from ~30 percent in 2000 to ~10 percent in 2020, even as climate risk intensified. *Source: [AIB data](#).*

Vertical 1: Water Rights

Market Size and Growth

Water rights, legal entitlements governing the extraction and use of surface water and groundwater, represent the foundational layer of the water investment universe. They are governed in the western United States by the prior appropriation doctrine (first in time, first in right) and elsewhere by riparian principles. The global water trading market was valued at approximately \$23.1 billion in 2023 and is projected to reach \$50.3 billion by 2032 at a CAGR of 9.12 percent, per [Zion Market Research](#). A separate estimate from [Coherent Market Insights](#) projects the water trading market at \$25.6 billion in 2026 reaching \$54.2 billion by 2033 at a 13.34 percent CAGR.

Key Investable Sub-Sectors

- **Senior surface water rights** in the Colorado River Basin, California Central Valley, and Rio Grande system, the scarcest and most legally defensible entitlements.
- **Groundwater rights** in the High Plains Aquifer (Ogallala), Sacramento Valley, and Arizona's Central Arizona Project allocations.
- **Water storage credits** via off-stream reservoirs and underground storage and recovery (ASR) facilities.
- **Environmental water purchases** by federal and state buybacks for in-stream flows, funded through conservation programs.
- **CME Group California Water Index futures** as a nascent but growing financial instrument enabling price discovery.

Representative Public Comparables

No pure-play public water rights vehicle currently exists in the U.S. following the 2022 acquisition of Vidler Water Resources by D.R. Horton at \$15.75 per share, a 19 percent premium to VWAP, per [D.R. Horton's press release](#).

Representative Private Capital

- **Water Asset Management (WAM)**: specialist water-only manager (~\$400M+ AUM); recently purchased \$100 million of Arizona farmland for embedded water rights in 2024. *Source: [PEI Media, A Liquid Portfolio: Water Education Colorado, Liquid Assets](#).*
- **Ecosystem Investment Partners**: focused on mitigation banking and environmental water markets.
- **Ridgewood Infrastructure**: water rights-adjacent positions through infrastructure fund strategy.
- **Family offices and agricultural landholders**: holding grandfathered entitlements.

Key Risks

- **Regulatory curtailment:** climate change has already reduced Colorado River flows by nearly 20 percent; junior rights face curtailment during drought.
- **Political risk:** state attorneys general and legislatures scrutinize non-agricultural water-rights acquisitions (Arizona AG Kris Mayes publicly challenged WAM's 2024 purchase).
- **Valuation opacity:** no standardized mark-to-market methodology; pricing is highly transactional and jurisdiction-specific.
- **Hydrologic risk:** long-duration drought can impair even senior rights if total system flows decline below adjudicated allocations.

Return Profile

In Australia's Murray-Darling Basin, water entitlements account for roughly 40 percent of capital assets for horticulture farms; during the 2018 to 2019 drought, water allocation prices increased 140 percent even as agricultural revenues fell 23 percent, per [Farrelly Mitchell](#). Under normal conditions, entitlements generate annual yields of 4 to 8 percent through lease income. In California's Central Valley, farmland with senior water rights commands premiums of 40 to 50 percent over comparable properties with less certain access. Target IRR for institutional water-rights strategies: 10 to 15 percent net, driven primarily by asset appreciation and optionality value.

Vertical 2: Water Infrastructure

Market Size and Growth

Water infrastructure, encompassing pipes, treatment plants, storage, conveyance, and both regulated and private utilities, is the largest and most capital-intensive vertical. The Global Water Infrastructure Development Market was valued at \$25.84 billion in 2024 and is expected to reach \$46.44 billion by 2030 at a CAGR of 10.1 percent, per [Techsci Research / Research and Markets](#). The U.S. utility sector alone faced an estimated \$110 billion funding gap in 2024, potentially rising to \$194 billion by 2030 per McKinsey, as cited in [Construction Dive](#). The IJIA allocated approximately \$69 billion for water infrastructure, including \$14 billion for State Revolving Funds, \$15 billion for lead service line replacement, and \$10 billion for PFAS remediation.

Key Investable Sub-Sectors

- **Regulated investor-owned utilities (IOUs):** rate-based businesses with authorized ROEs averaging ~9.6 percent in U.S. rate cases. *Source: [S&P Global Market Intelligence](#).*
- **Private water utilities and concessions:** international concession models generate higher returns but carry greater political risk.

- **Transmission and distribution:** water infrastructure repair technologies market at \$70.17 billion in 2024, projected to \$166.43 billion by 2034 at 8.3 percent CAGR. *Source: [Zion Market Research](#).*
- **Wastewater treatment and collection systems.**
- **Stormwater management infrastructure.**

Representative Public Comparables

COMPANY	TICKER	KEY METRIC
American Water Works	AWK	~\$25.7B mkt cap; \$16 to \$17B capex plan 2025 to 2029; 13 acquisitions in 2024
Essential Utilities	WTRG	~\$11B mkt cap; merger with AWK announced Oct 2025 at ~\$63B combined
Advanced Drainage Systems	WMS	Revenue \$2.9B FY2024; 9 consecutive years of record profitability
Watts Water Technologies	WTS	Revenue \$2.25B in 2024; 8 percent growth in 2025
Roper Technologies	ROP	Diversified industrial/infrastructure tech with water-sector software exposure

[American Water Works](#) has completed 40-plus acquisitions since 2021, with a \$40 to \$42 billion ten-year capex plan (2025 to 2034). Its October 2025 merger with [Essential Utilities](#) will create a ~\$63 billion combined entity, the defining consolidation event of the current water cycle.

Representative Private Capital

- **KKR:** Northumbrian Water (2022), Axius Water (2019); exploring £4B Thames Water investment. *Source: [Smart Water Magazine](#).*
- **Brookfield Asset Management:** active in global water utilities; manages €300B-plus in infrastructure AUM. *Source: [Macquarie IPE rankings](#).*
- **Ridgewood Infrastructure:** \$1.2B Fund II closed January 2025; U.S. lower middle-market water/utility focus. *Source: [Ridgewood](#).*
- **Morgan Stanley Infrastructure Partners:** Seven Seas Water (2020), Water-as-a-Service desalination in Caribbean and Peru.
- **Ember Infrastructure:** \$395M acquisition of H2O Innovation (2023); \$500M second green fund.

Key Risks

- **Regulatory lag:** capital expenditures incurred before rate approvals, creating dilution during heavy investment cycles.

- **PFAS and contaminant liability:** potentially multi-billion-dollar remediation obligations as EPA tightens PFAS standards.
- **Interest rate sensitivity:** regulated utilities valued as bond proxies, inversely correlated with long rates.
- **Climate-induced capex acceleration:** flooding, drought, and heat stress require unplanned resilience investments.

Return Profile

Regulated water utilities generate bond-like cash flows with dividend yields of 2 to 4 percent and total returns targeting 7 to 10 percent IRR. Per [Cambridge Associates](#), the median net IRR for infrastructure funds (vintage 2009 to 2020) was 9.8 percent, with core funds targeting 7 to 10 percent net IRR and value-add strategies targeting 12 to 16 percent or more. Regulated water infrastructure sits firmly in the core category.

Vertical 3: Agricultural Water

Market Size and Growth

Agriculture accounts for approximately 70 percent of global freshwater withdrawals. In the U.S., three-quarters of on-farm irrigation spending is devoted to water delivery and management, per [Bluefield Research](#). Bluefield projects U.S. irrigation spending of \$84 billion over the next five years (2026 to 2031), averaging \$13.5 billion annually, with digital irrigation technologies growing at a CAGR of 12.9 percent. The global precision irrigation market was valued at \$4.18 billion in 2024 and is projected at \$6.29 billion by 2029 at a CAGR of 8.5 percent, per [MarketsandMarkets](#). The microirrigation systems segment is projected to reach \$21.56 billion by 2030 at a 9.7 percent CAGR, per [PR Newswire / MarketsandMarkets](#).

Key Investable Sub-Sectors

- **Irrigation district ownership and management:** approximately 850 districts, federal water projects, and private companies in the U.S. West alone.
- **Water-rich farmland:** WAM invested over \$300 million in Western agriculture as of 2020. *Source:* [Water Education Colorado](#).
- **Crop-to-urban water transfers:** multi-billion-dollar opportunity in the Colorado River Basin; payments can reach \$1,500 per acre or more.
- **Ag water technology:** precision irrigation, drip systems, remote soil moisture monitoring, advanced delivery infrastructure.
- **Water conservation programs:** USDA invested \$400 million with 18 irrigation districts across 12 Western states in 2024. *Source:* [USDA](#).

Representative Public Comparables

- **Valmont Industries (VMI)**: major supplier of center-pivot irrigation systems.
- **Lindsay Corporation (LNN)**: center-pivot irrigation manufacturer with global footprint.
- **Advanced Drainage Systems (WMS)**: \$2.9B FY2024 revenue; nine consecutive years of record profitability. *Source: [ADS](#).*
- **Ecolab (ECL)**: \$15.74B full-year 2024 revenue; water management services for agriculture and industry. *Source: [Ecolab](#).*

Representative Private Capital

- **Water Asset Management (WAM)**: \$300M-plus deployed in Western U.S. irrigated agriculture; recent \$100M Arizona farmland purchase.
- **Aqua Capital**: Latin America-focused fund active in agricultural water and agribusiness.
- **Ecosystem Investment Partners**: mitigation banking and conservation credits intersecting ag water.
- **Family offices**: acquiring irrigated cropland in Colorado, Columbia, and Rio Grande basins as combined ag and water assets.

Key Risks

- **Political and social risk**: agricultural water acquisitions by financial investors attract regulatory and community pushback.
- **Commodity price correlation**: weak ag commodity prices reduce grower profitability, constraining irrigation upgrades and lease revenue. *Source: [Duff & Phelps](#).*
- **Climate and hydrologic risk**: multi-year drought can permanently impair aquifer levels and curtail surface deliveries.
- **Transfer restrictions**: water transfers away from agricultural use face legal challenges under state doctrines and local groundwater rules.

Return Profile

Agricultural water investing combines income streams from farming and water leases (typically 4 to 8 percent annual cash yield under normal conditions) with appreciation potential tied to the scarcity premium on embedded water rights. For institutional-grade portfolios with adequate scale and legal infrastructure, target IRRs of 8 to 14 percent net are generally achievable, with upside scenarios driven by crop-to-urban transfer transactions.

Vertical 4: Water Technology

Market Size and Growth

Water technology, encompassing treatment chemicals and systems, desalination, advanced water reuse, real-time monitoring, digital water management platforms, and smart metering, is the highest-growth and most venture-capital-receptive vertical in the water universe.

- **Water & Wastewater Treatment Technologies (overall):** \$321 billion in 2024, projected at \$591 billion by 2030 at an 11.0 percent CAGR. *Source: [BCC Research](#).*
- **Specialty Water Treatment Chemicals:** \$40.4 billion (2024), growing to \$57.9 billion by 2030 at 6.4 percent CAGR. *Source: [BCC Research](#).*
- **Water Desalination Market:** \$21.74 billion in 2024, projected at \$58.38 billion by 2033 at 11.6 percent CAGR; MENA holds ~50 percent of global capacity. *Source: [Straits Research](#).*
- **Water Reuse:** U.S. municipal reuse projected to drive \$47.1 billion in CAPEX from 2025 through 2035; potable reuse accounts for 37 percent of new capacity. *Source: [Bluefield Research](#).*
- **Smart Water Metering:** projected to reach \$9.04 billion by 2030 from \$4.61 billion in 2024 at 11.9 percent CAGR. *Source: [MarketsandMarkets](#).*
- **Smart Water Management platforms:** \$23.7 billion in 2025 to \$43.7 billion by 2030 at 13.0 percent CAGR. *Source: [BCC Research / Yahoo Finance](#).*
- **Equity capital 2024:** \$1 billion-plus invested in water technology companies, an all-time record. *Source: [GWI WaterData](#).*

Key Investable Sub-Sectors

- **Membrane technologies:** reverse osmosis, nanofiltration, ultrafiltration, the backbone of desalination and advanced treatment.
- **PFAS and emerging contaminant remediation:** GAC, advanced oxidation, ion exchange systems driven by EPA's 2024 PFAS standards.
- **Desalination:** SWRO and thermal; Veolia's Water Technologies segment reported 7.0 percent organic growth in 2024. *Source: [Veolia 2024 Annual Results](#).*
- **Advanced water reuse and direct potable reuse (DPR):** the fastest-growing application of water technology infrastructure.
- **Digital water:** IoT sensors, AI demand forecasting, remote asset monitoring, leak detection.
- **Smart metering (AMI):** American Water has installed over 1.5 million AMI endpoints as of 2024, target of 2 million by 2026.

Representative Public Comparables

COMPANY	TICKER	2024 REVENUE	KEY FOCUS
Xylem	XYL	\$8.6B	Water infrastructure, treatment, smart solutions
Ecolab	ECL	\$15.74B	Water treatment, hygiene, industrial water
Veolia Environnement	VIE (Paris)	€44.7B total	Desalination, industrial and wastewater
Pentair	PNR	~\$4.2B	Filtration, flow control, pool equipment
A.O. Smith	AOS	~\$3.5B	Water heaters, water treatment products
Watts Water Technologies	WTS	\$2.25B	Flow control, water quality, smart/connected systems

[Xylem](#) generated \$8.6 billion in 2024 revenue, with Water Infrastructure contributing \$2.56B and Water Solutions & Services \$2.34B. [Ecolab](#) reported record 2024 free cash flow of \$1.8 billion. [Watts Water Technologies](#) reported record 2025 results with \$2.44B in sales, up 8 percent year-over-year.

Representative Private Capital

- **Blackstone:** Geosyntec (environmental engineering), Desotec (mobile carbon filtration), Legence (water efficiency); previously invested in De Nora (exited 2020).
- **Bain Capital:** AqueoUS Vets (PFAS, 2022), Arxada (specialty biocides, 2021), Italmatch Chemicals (water treatment additives, 2018).
- **Ember Infrastructure:** H2O Innovation (water reuse, \$395M acquisition 2023).
- **H.I.G. Capital:** United Flow Technologies (2021), platform for water treatment M&A.
- **XPV Water Partners:** Canada-based specialist fund backing growth-stage water technology companies.

Key Risks

- **Technology adoption risk:** municipal customers are slow to adopt unproven technologies due to regulatory standards, public health liability, and procurement cycles.
- **Regulatory timing:** PFAS and contaminant regulations represent a major tailwind with uncertain timelines.
- **Competitive intensity:** well-capitalized incumbents compress margins for undifferentiated solutions.
- **Execution risk:** desalination and advanced treatment projects are capital-intensive megaprojects with significant construction and commissioning risk.

Return Profile

Growth- and venture-stage water technology companies target 15 to 25 percent-plus gross IRR, reflecting technology risk. Public comparables trade at premium multiples (Xylem P/E ~31.6x, Pentair ~26.9x per [Artificial analysis](#)). Infrastructure-oriented water technology assets (operating desalination plants, long-term reuse concessions) target 10 to 14 percent net IRR consistent with core-plus infrastructure. Digital water and smart metering platforms warrant SaaS-like valuations with higher growth expectations.

M&A Activity and Sector Consolidation

[Baird Global Water Franchise](#) has completed approximately \$33 billion in water-sector M&A and financing transactions since 2012, with median sell-side EBITDA multiples of approximately 13x. Key recent transactions:

- **American Water Works / Essential Utilities Merger (2025)**: an all-stock deal creating a ~\$63 billion combined entity, the largest utility merger in U.S. water history, at an enterprise value of \$19.1 billion (14.3x EBITDA). *Source: [The McLean Group](#).*
- **KKR's sale of Ecorbit to IMM consortium (\$2.07B, 2024)**: highlighted PE's ability to navigate complex infrastructure exits.
- **Ember Infrastructure / H2O Innovation (\$395M, 2023)**: major water reuse and treatment technology consolidation play.
- **Littlejohn & Co. / HydroChemPSC to Clean Harbors (\$1.25B, 2021)**: industrial water services exit.
- **GWJ Top 50 (2024)**: AECOM, Jacobs, and WSP as the fastest-growing large companies in water; Solenis rising to challenge Ecolab in treatment chemistry. *Source: [GWJ LinkedIn](#).*

Synthesis: The Four Verticals as a Portfolio Framework

VERTICAL	MARKET SIZE (2024)	CAGR	EXPECTED NET IRR	PRIMARY RISK
Water Rights	~\$23B (trading)	9 to 13%	10 to 15%	Regulatory curtailment, political risk
Water Infrastructure	\$850B (broad scope)	6 to 10%	7 to 12% (core to core+)	Regulatory lag, PFAS, rate sensitivity
Agricultural Water	\$4 to \$14B (equipment); \$84B U.S. spend 5 yrs	9 to 13%	8 to 14%	Commodity correlation, political risk
Water Technology	\$321B (treatment tech)	11 to 13%	12 to 25%+	Adoption, competition, execution

The four verticals are interconnected: water rights flow through infrastructure, irrigate agriculture, and increasingly require technological treatment before reuse. The \$7 trillion financing gap, the structural underpenetration of private capital, the accelerating M&A cycle, the regulatory push on PFAS and climate resilience, and the growing institutionalization of water markets across all four verticals collectively represent one of the most compelling multi-decade thematic investment opportunities in the real assets universe.

CLOSING PERSPECTIVE

Water is not a sector. It is the connective tissue of every sector. The four verticals offer discrete risk-return profiles, but the underlying thesis is a single one: scarcity is becoming investable.

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