The Future of Water

A snapshot of the global water industry's challenges, market shifts, and innovative solutions.

A World of Extremes: The Climate Reality

Intensifying Droughts

Water scarcity is a growing threat globally, with regions like the US seeing nearly every state experience "abnormally dry conditions" in 2024.

Extreme Flooding

Many of the world's most populated cities are increasingly exposed to "climate whiplash," facing the dual threats of both severe droughts and catastrophic floods.

A Market Reshaped by Need

Digital Water Market

IoT, AI, and smart platforms are revolutionizing water management.

2024 **$6.7B** → 2032 (est.) **$16B**

~12% CAGR

Water as a Service (WaaS)

A shift from infrastructure ownership to outcome-based service models.

2024 **$58.4B** → 2032 (est.) **$129.7B**

~10.5% CAGR

Pioneering Solutions for a Thirsty Planet

Data synthesized from reports by BCG, McKinsey, and market analyses (2023-2025).

Sizing the Opportunity

An analysis of the global water market's Total Addressable Market (TAM) and the high-growth Serviceable Available Markets (SAM) driving its transformation.

The Total Addressable Market (TAM)

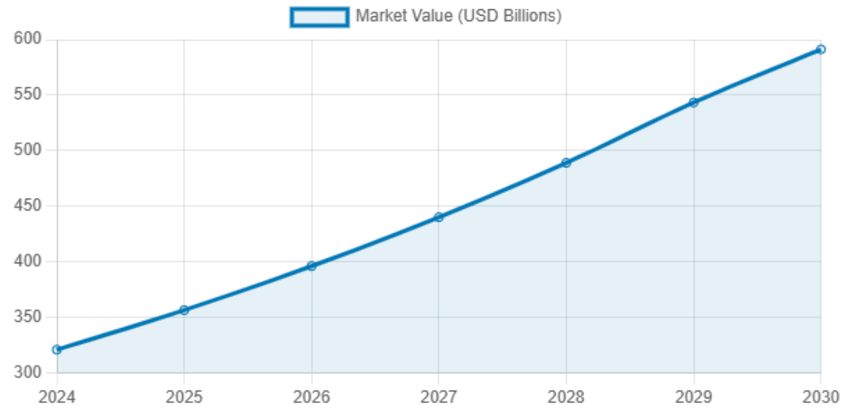
Global Water Sector TAM

$750B+

The estimated total addressable market for the global water industry, excluding operational expenditures like labor and energy.

Source: Xylem Inc. Estimates

Global Water & Wastewater Treatment Tech Market



Source: BCC Research

The Serviceable Available Market (SAM)

While the total market is vast, the highest growth is concentrated in specific service-based and technology-driven segments that are rapidly modernizing the industry.

Water-as-a-Service (WaaS)

10.5%

CAGR (2025-2032)

$58.4B → $129.8B

Source: DataM Intelligence

Desalination Technologies

~8.7%

CAGR (2024-2032)

$25.7B → $49.8B

Source: Fortune Business Insights

Digital Water Solutions

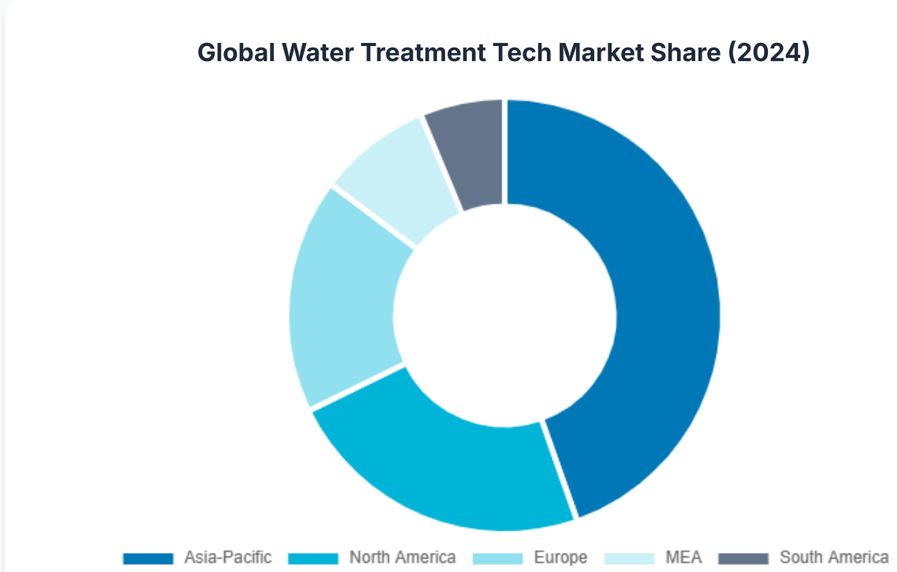
~11.9%

CAGR (2024-2032)

$6.7B → $16.3B

Source: SNS Insider

Regional Dynamics: Where Growth is Concentrated



Source: BCC Research

Asia-Pacific (APAC)

The largest overall market at **$143.2B (44.6%)**, driven by industrialization and urbanization, particularly in China.

North America

The leader in **Digital Water adoption (38.6%)** and the highest projected CAGR for treatment tech (**12.8%**) due to infrastructure modernization.

Middle East & Africa (MEA)

The dominant force in **Desalination (53% market share)**, with an expected **$80B** investment from Saudi Arabia alone.

Pricing & Financial Trends

The Fundamental Shift: CapEx to OpEx

The core driver for WaaS adoption is the move from large, upfront capital expenditures (CapEx) to predictable, recurring operational expenditures (OpEx). This model transfers the risk of asset performance and technology obsolescence from the customer to the WaaS provider, enabling faster adoption of innovation.

Source: Frost & Sullivan, BCG, Seven Seas Water BOOT Agreements

Outcome-Based Value

WaaS contracts are outcome-driven, guaranteeing water quality and uptime. This results in **15–30% growth** in recurring revenues for providers.

Source: Frost & Sullivan, Evoqua/Xylem Water One® Reports

Energy Costs

Energy can account for **30–40%** of operational costs for treatment systems, making energy efficiency a key battleground for technology innovation.

Source: Fortune Business Insights, Energy Recovery Inc., BCC Research

U.S. WTaaS: A High-Growth Niche

The Water Treatment as a Service market in the US is projected to grow from ~$78M in 2024 to ~$277M by 2033, demonstrating a powerful **~14.8% CAGR**.

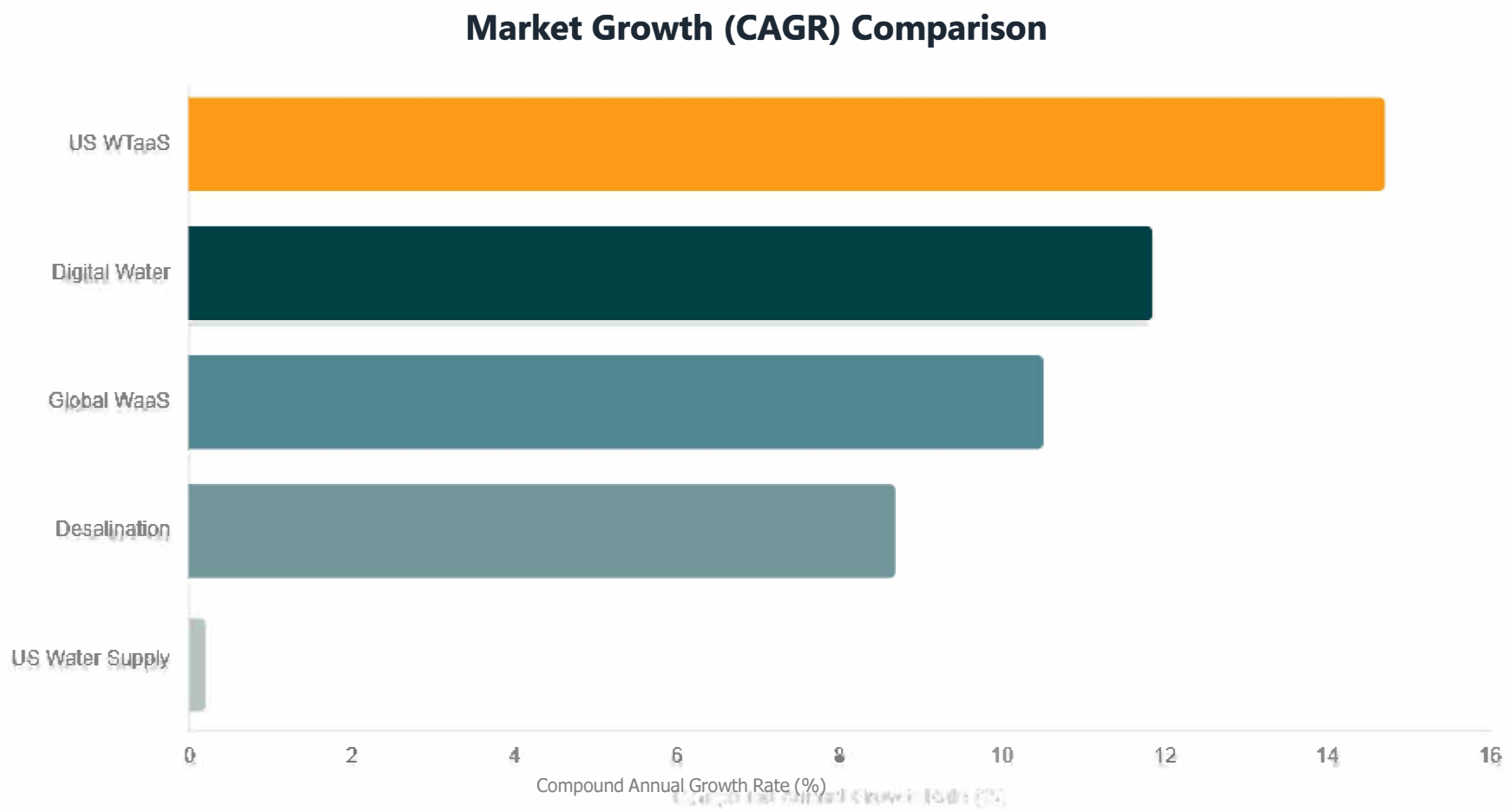
Source: GrandView Research, NovaOne Advisor

Following the Capital

An analysis of the investment trends, key players, and landmark deals driving the transformation of water infrastructure, from desalination to digital solutions.

The Investment Thesis: Where is the Growth?

While the total water market is vast, sophisticated capital is flowing into high-growth, technology-enabled segments that significantly outperform the traditional utility sector.



Sources: DataM Intelligence, Fortune Business Insights, IBISWorld, SN Insider

The Two Streams of Capital

Venture Capital

Funding Disruption

VCs target early-stage companies with disruptive technologies, funding innovation in areas like AI-powered analytics, advanced materials, and novel treatment processes. While representing only 1-2% of Climate Tech funding, this is where the next generation of technology is born.

Active Players:
Breakthrough Energy Ventures, SOSV, Katapult, Emerald Technology Ventures, 360 Capital, Builders VC.

Private Equity

Building Platforms

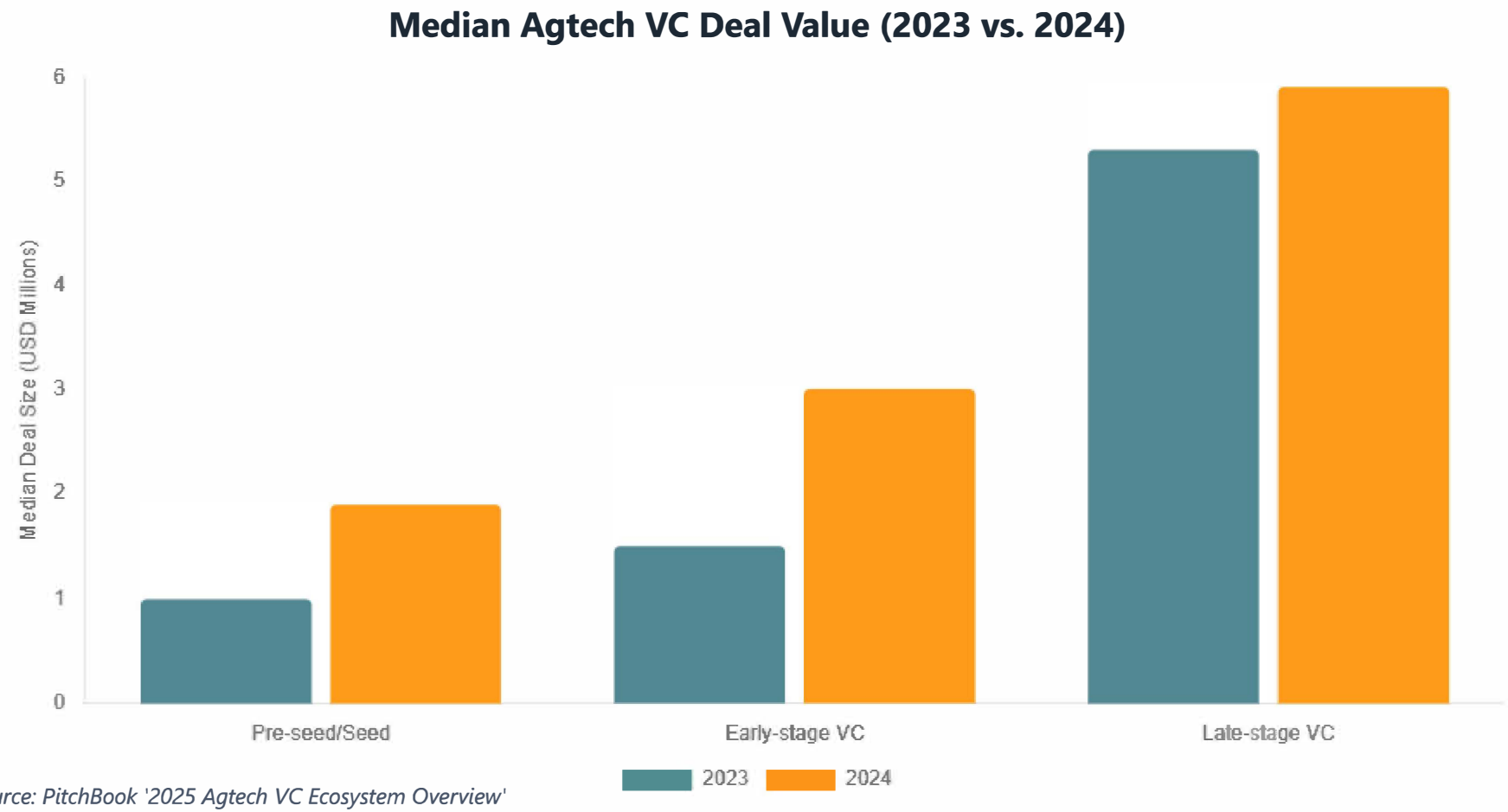
PE firms are the dominant force in the mid-market, executing sophisticated 'buy and build' strategies. They acquire platform companies and use them to consolidate fragmented sectors, creating integrated market leaders with significant scale.

Active Players:
KKR (Axius Water), Blackstone (Geosotec), Ember Infrastructure (H2O Innovation), Morgan Stanley (Seven Seas), Bain Capital (AqueoUS Vets).

Sources: PitchBook, General Market Analysis

A Flight to Quality: Rising Deal Sizes

Proxy data from the related Agtech VC ecosystem shows a clear trend: despite a lower deal count, investors are writing larger checks for companies with proven market traction.



Source: PitchBook '2025 Agtech VC Ecosystem Overview'

Landmark Deals & Exits (2023-2025)

LATE-STAGE VC

Gradiant

$300M

Series D Round (May 2023)

Cemented "unicorn" status at a $1.02B valuation to scale its advanced water treatment solutions globally.

M&A EXIT

Xylem acquires Evoqua

$7.5B

Mega-Merger (2023)

A transformative deal creating a global leader in water technology with an unparalleled end-to-end portfolio.

SEED ROUND

Oxyle

$16M

Seed Round (2024)

Significant seed funding for its novel technology to destroy PFAS "forever chemicals" via a TaaS model.

PE ACQUISITION

TJC acquires USALCO

$2B

PE Buyout (2024)

A major PE acquisition consolidating the water treatment chemicals supply chain.

STRATEGIC SPIN-OFF

DuPont Water Business

$1.5B

Public Company Spin-Off

Creation of a new, pure-play public water company to unlock value and pursue targeted M&A.

SERIES A ROUND

StormHarvester

$10.5M

Series A Round (Jan 2025)

Funding for its AI-powered analytics platform for wastewater utilities.

Source: Public Filings, News Reports

The Policy Catalyst

An analysis of the public sector programs, funding mechanisms, and partnership models that are accelerating water infrastructure development worldwide.

United States: A Historic Reinvestment

The U.S. is leveraging significant federal funding to modernize aging infrastructure and address emerging water quality challenges.

$8.3 Billion

Bureau of Reclamation

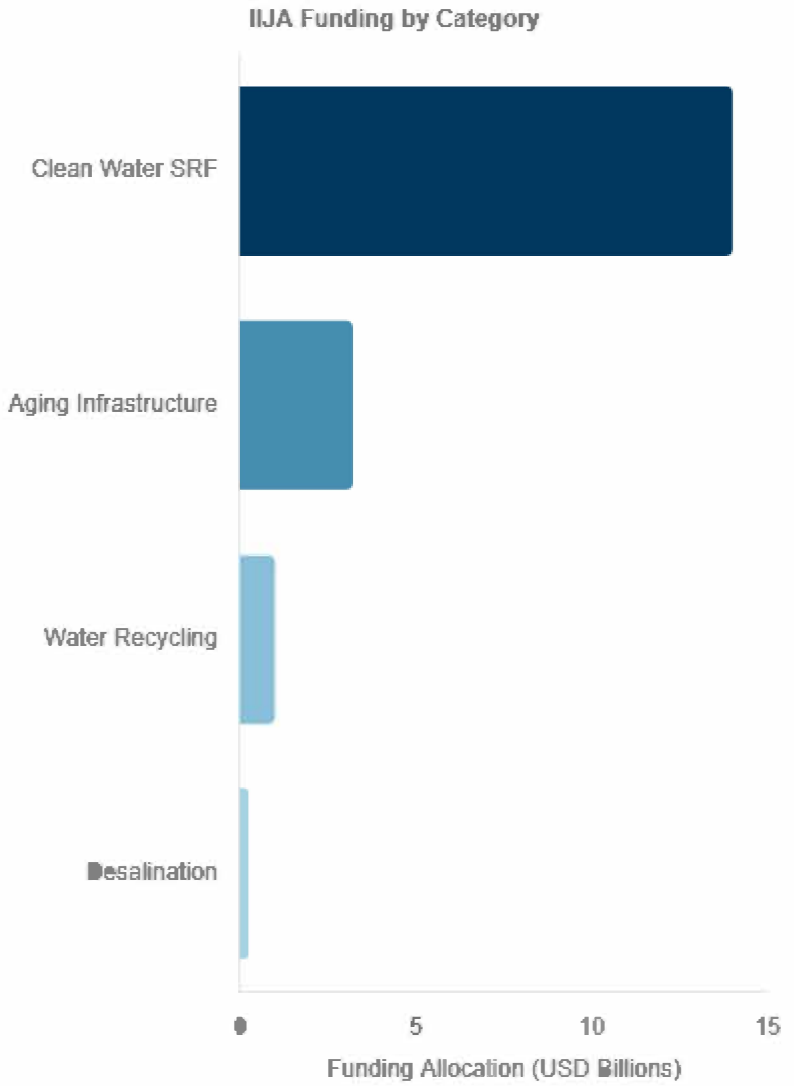
Total IIJA funding for Western water infrastructure projects over five years.

$250 Million

Dedicated Desalination Grants

Specific IIJA allocation to support new seawater and brackish water desalination facilities.

IIJA Water Funding Allocations



Sources: U.S. Bureau of Reclamation, EPA, IIJA Analysis

2025 Update: IIJA Implementation & Funding Disruption

While the IIJA remains law, its implementation has been fundamentally altered, creating legal challenges and significant uncertainty for stakeholders across the infrastructure, energy, and water sectors as of mid-2025.

The Trump Administration’s Impact on the IIJA

Policies and actions taken by the Trump administration during its second term have had a direct and significant impact on the IIJA's implementation, altering its pace and priorities through executive orders, OMB directives, and regulatory shifts.

1. Funding Freezes & Judicial Intervention

An immediate pause on IIJA disbursements via **Executive Order 14154 (January 20, 2025)** stalled key infrastructure projects. By **March 2025**, multiple states had filed lawsuits, leading to court injunctions.

2. Regulatory & Political Realignment

In **February 2025**, the EPA initiated a broad rollback of environmental standards, while the administration's energy policy shifted to favor fossil fuels, impacting IIJA-supported projects.

3. Executive Interventions in Water Management

The White House bypassed state restrictions in **April 2025** to order emergency water releases from California dams for agricultural irrigation, reflecting a broader strategy of centralizing water authority.

Source: Analysis of Public Statements and Executive Orders (2025)

Global Policy Hotspots

SA Middle East

Desalination as National Strategy

The MEA region dominates the global desalination market (53% share). Saudi Arabia's **Vision 2030** is driving an **$80 billion investment** in new projects, while the UAE's **Water Security Strategy 2036** mandates a shift to 100% clean energy for desalination.

EU European Union

Regulation-Driven Circularity

The **Water Framework Directive (WFD)** creates a legally binding mandate for member states to achieve 'good status' for all water bodies, creating powerful incentives for water reuse and resource recovery solutions.

IN India

Public Investment & PPPs

The **Jal Jeevan Mission**, a ~$50B program, is driving massive infrastructure investment. The National Water Policy explicitly encourages **Public-Private Partnerships (PPPs)** to bridge the funding gap, a major opportunity for WaaS providers.

Sources: National Policy Documents, Market Reports

Water-as-a-Service & Desalination

June 2025

> *Note: This is a sample output based on real data, designed as a dialogue starter for co-building.*

High-Growth Market Segments

The global market for water and wastewater treatment technologies was valued at **$321 billion in 2024** and is projected to reach **$591.2 billion by 2030**. Fall Line Capital's focus on the Water-Ag Nexus targets the challenges and opportunities within these legacy sectors.

US Water-as-a-Service

$176.1M

Projected market size by 2030 (14.7% CAGR).

Digital Water Solutions

$13.1B

Projected market size by 2030 (11.85% CAGR).

Desalination Technology

$42.3B

Global market projection for 2030 (8.68% CAGR).

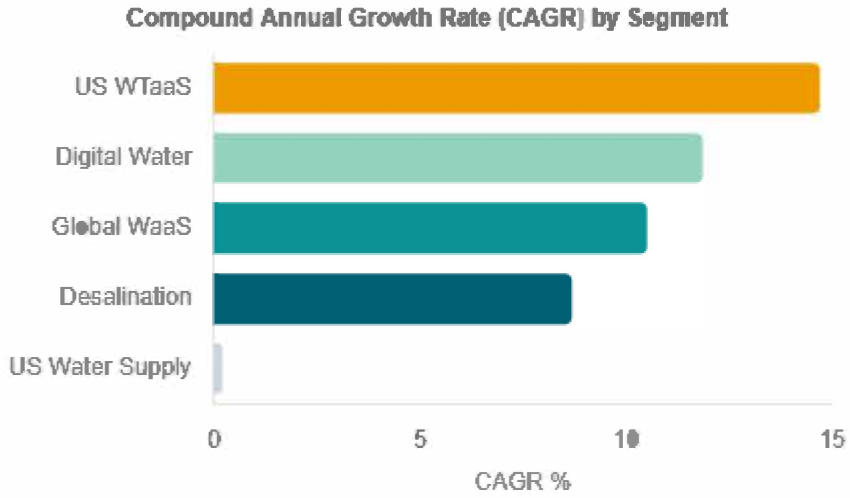
PFAS Destruction

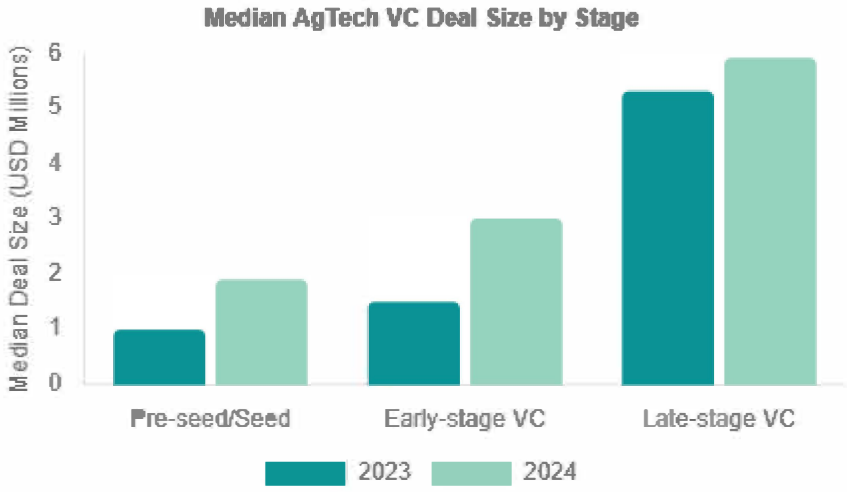
Regulatory Driven

Compliance market fueled by EPA mandates & $1B in federal funds.

Sources: DataM Intelligence, SNS Insider, Fortune Business Insights, EPA Regulation

High-Growth Segments & Investor Trends





Sources: PitchBook, NotebookLM Analysis

Technology & IP Landscape

> The most valuable IP resides in system-level solutions that apply modern data analytics and biotechnology to unlock efficiencies in legacy sectors like agriculture.

- **Advanced Membranes:** Foundational hardware enabling a market shift from chemical to technology-based treatment.
- **Brine Management & ZLD:** Hallmark of advanced WaaS, nearly doubling freshwater output from the same source.
- **AI & Data Analytics for Resource Efficiency:** Software-led optimization, highlighted by FLC's investment in Plutoshift AI.
- **Hardware-Enabled SaaS:** Fusing intelligent hardware (IoT sensors) with recurring software to create continuous data streams.
- **RNA-based Biotechnology:** Sustainable solutions for agriculture, such as those developed by GreenLight Biosciences.

Source: NotebookLM Synthesis, FLC Portfolio Analysis

Competitive Landscape

Tier	Company Examples	Business Model Focus	Key Differentiator / Strategy
Tier 1: Giants	Xylem, Veolia	Scale | M&A | End-to-End Contracts	Leveraging global footprint to win large-scale, integrated projects.
Tier 2: Challengers	Gradiant, Ekopak	Tech Superiority | WaaS | Capital Efficiency	Proprietary IP in high-margin niches delivered via service models.
Tier 3: Innovators	Plutoshift AI, GreenLight	Asset-Light | SaaS | Niche Problems	Agile, venture-backed models targeting specific, unsolved problems.

Sources: General Market Analysis, PitchBook

FLC Representative Investments

Company	Vertical	Notes / Key Milestones
Plutoshift AI	Business/Productivity Software	[Post Valuation: $33.33M | 29-Jun-2022] [Last Financing: $0.65M| 07-Aug-2024]
Trace Genomics	Media & Information Services (B2B)	[Post Valuation: $38.20M | 08-Jul-2020] [Last Financing: $10.50M | 20-Feb-2024]
GreenLight Biosciences	Biotechnology / AgTech	[Post Valuation: $45.50M Est. | 24-Jul-2023] [Last Financing: $25.00M | 26-Mar-2025]

Source: PitchBook

Strategic Positioning

Challenge: Legacy sectors like agriculture are capital-intensive and historically slow to adopt transformative technology.

Opportunity: Applying proven technology models (data analytics, SaaS, biotech) can unlock massive efficiency gains.

Thesis: FLC's strategy is to invest in tech-forward companies that embed software and data into legacy industries to create scalable solutions.

High-Value Verticals to Watch

- **Brine Valorization:** Monetize waste streams by recovering critical minerals.
- **PFAS Destruction-as-a-Service:** High-margin, compliance-driven market.
- **AI for Agriculture:** Scalable SaaS for precision irrigation & water offsets.

Source: NotebookLM Synthesis

Strategic Angles for Fall Line Capital

Direct Investment Thesis

- Focus on Later Stage VC (>50% of deals).
- Target IT, B2B Software, and Materials Science disrupting legacy industries.
- Maintain strong preference for US-based companies (>87% of deals).

Ecosystem & Platform Plays

- Invest in foundational data platforms (e.g., Trace Genomics).
- Back companies creating new, high-value data sets.
- Support integration of portfolio companies into the Ag value chain.

Source: PitchBook Analysis of FLC Investment Style & Portfolio

The Flow of the Future

Water as a Service (WaaS)

A paradigm shift from owning infrastructure to buying outcomes.

A Surging Market

The global WaaS market is experiencing explosive growth, driven by scarcity, regulation, and the demand for sustainable, efficient water management.

2024 Global Market

$58.4B

Source: DataM Intelligence

2032 Projection

$129.7B

Source: DataM Intelligence

Global CAGR

10.5%

Through 2032

Deconstructing WaaS & Its Driving Forces

The WaaS Ecosystem

1. **Infrastructure**
   The physical assets: sensors, smart meters, and treatment hardware.
2. **Digital Platforms**
   The intelligence layer: cloud data platforms, AI/ML, and digital twins.
3. **Service Offerings**
   The commercial models: WTaaS, LDaaS, and IaaS contracts.
4. **End-User Apps**
   The customers: industrial, municipal, and agricultural applications.

Forces Driving Adoption

Water Scarcity
Climate change and population growth strain supplies, forcing a shift to resilient alternatives.

Aging Infrastructure
WaaS offers a CapEx-free path to modernize deteriorating public water systems and reduce water loss.

Tougher Regulations
Stricter discharge rules require advanced treatment that WaaS providers can expertly deliver.

ESG & Sustainability
Investor pressure pushes corporations to reduce their water footprint and improve sustainability.

Business Model & Regional Adoption

From CapEx to OpEx

Traditional Model

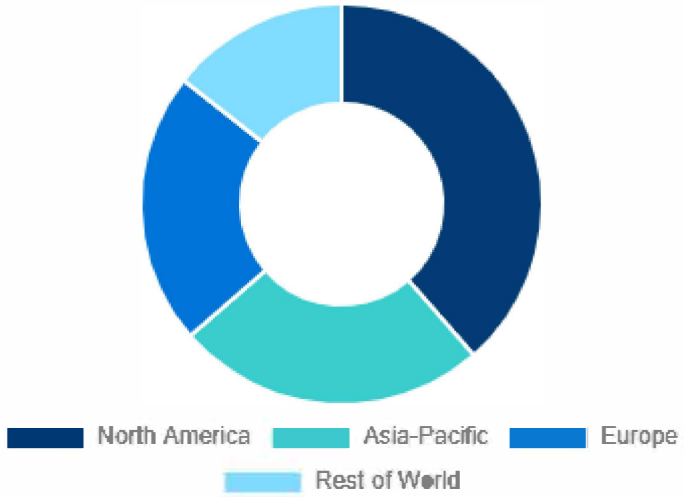
BUY ASSET (CapEx)
High upfront cost, customer owns all operational and technology risk.

→

WaaS Model

BUY OUTCOME (OpEx)
Predictable fee, provider owns asset and guarantees performance.

Digital Water Market Share by Region

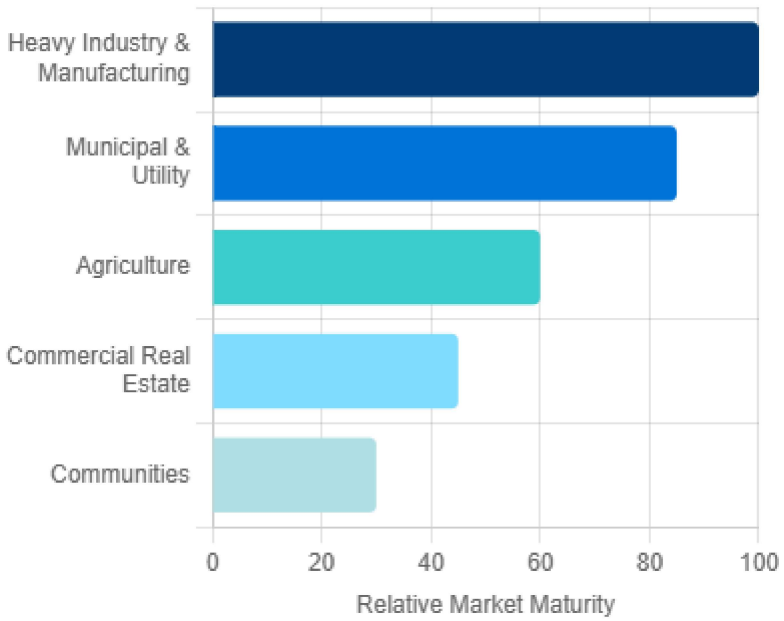


Source: MarketsandMarkets

Who Uses WaaS?

Adoption is accelerating across diverse sectors, each with unique needs and applications, led by heavy industry.

Primary Customer Segments



Source: Illustrative data based on market analysis

🏭 Heavy Industry & Manufacturing

The most mature market. Needs include ultrapure process water (semiconductors), cooling water (data centers), and ZLD systems.

🏙️ Municipalities & Smart Cities

Adoption via Public-Private Partnerships for smart metering, leak detection, and upgrading treatment plants.

🌾 Agriculture

Emerging segment focused on Precision Irrigation-as-a-Service to conserve water and maximize crop yields.

Infographic based on the "Water as a Service (WaaS): 2025 Advanced Intelligence Report".

The Desalination Market

A Strategic Analysis of a Climate-Independent Water Solution

JUNE 2025

Market Sizing & Forecasts

As water scarcity intensifies globally, desalination is shifting from a niche solution to a critical component of national water security. The market is demonstrating robust, sustained growth, driven by both public and private investment in climate-resilient infrastructure.

Market Forecasts

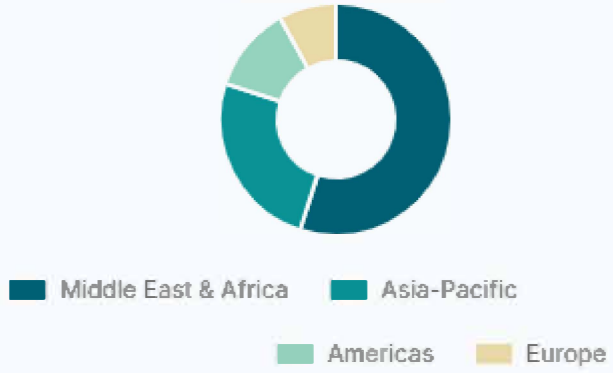
$49.8B — **Fortune Business Insights**
by 2032 (8.68% CAGR)

$34.6B — **Coherent Market Insights**
by 2032 (8.9% CAGR)

+$9.1B — **Technavio**
2023-2028 (8.43% CAGR)

Sources: Fortune Business Insights, Coherent Market Insights, Technavio

Regional Market Share (2024)



Source: Desalination Research Gap Analysis

Technology & Innovation

Innovation in desalination is focused on enhancing efficiency, reducing costs, and minimizing environmental impact. While Reverse Osmosis (RO) remains the dominant technology, significant advancements are being made in membrane materials and brine management, creating new opportunities for value creation.

The Energy-Cost Challenge

Energy is the largest operational cost for desalination, accounting for up to **60%** of plant expenses. Reducing this is the primary driver of innovation. High-efficiency **Energy Recovery Devices (ERDs)**, now standard in new plants, can cut energy consumption by up to 60%, while integration with **solar PV** offers a path to decarbonization.

Source: Desalination and Renewable Energy: A Bibliometric Analysis

Advanced Membrane Materials

The frontier is in materials science. While incumbents like **DuPont** refine cost-effective TFC membranes, challengers like **LG Chem** are commercializing **graphene-based membranes** that promise superior permeability and anti-fouling properties, leading to lower energy use.

Brine Management: From Waste to Value

Managing the high-salinity brine waste stream is a critical challenge and a major area of innovation. Technologies like **Counter-Flow Reverse Osmosis (CFRO)**, pioneered by **Gradiant**, can treat brine to nearly double a plant's freshwater output. Furthermore, **brine valorization**—recovering valuable minerals like lithium—is creating new revenue streams to offset high operational costs and improve the environmental footprint of desalination.

Source: PitchBook, Desalination Research Gap Analysis

Policy & Funding Mechanisms

Public policy and government funding are powerful catalysts for the desalination market. Direct investment, regulatory mandates, and public-private partnership (PPP) frameworks are essential for financing these capital-intensive projects.

US United States

IIJA Funding: The Infrastructure Investment and Jobs Act includes a **$250 million** grant program for desalination projects, administered by the Bureau of Reclamation.

State-Level Initiatives: Water-stressed states like California are a key market, with goals to significantly increase desalinated water production by 2040, supported by state and federal funds.

SA Middle East & AU Australia

National Strategies: The MEA region's market dominance is underpinned by strategic government commitments, including Saudi Arabia's **$80B** investment plan and the UAE's **Water Security Strategy 2036**.

Climate-Independent Planning: Australia's **National Urban Water and Desalination Plan** treats desalination as a core, reliable component of its long-term water supply strategy.

The Power of Public-Private Partnerships (PPPs):
Large-scale desalination projects are often delivered via PPPs using models like Build-Own-Operate-Transfer (BOOT). This allows governments to leverage private sector capital and expertise while transferring financial and operational risk. The **Victorian Desalination Project (AUD $3.5B)** in Australia is a prime example, with a two-part tariff structure ensuring both long-term availability and cost-efficiency.

Source: Desalination Research Gap Analysis, Navigating the Waters (BCG/WWF)

Methodology & Primary Sources

This report is a synthesis of intelligence gathered from a curated collection of over 60 primary and secondary sources. The analysis is built upon a foundation of proprietary market research reports, company financial filings and investor presentations, peer-reviewed scientific journals, and global news publications. Quantitative data was cross-referenced and triangulated where possible to ensure accuracy. The analysis and strategic recommendations represent our informed perspective based on this comprehensive body of evidence.