WATER MANAGEMENT TECHNOLOGY OPPORTUNITIES

PLURAL EXPERTISE

June 2020

Water management is an attractive platform for both technology corporations and investors due to strong secular trends

Water management sector macro dynamics

Strong fundamentals, globally

- Growing middle class and shift to urban areas
- Increasing water scarcity
- Aging infrastructure
- Positive changing environmental standards and sustainability
- Recycling and efficiency need due to rising water costs

Technology disruption

- Changing regulatory specifications
- Advancing technology (e.g. self cleaning filtration)
- Software and analytics integration

Fragmented

- Multiple sub-segments, many with a fragmented supplier landscape

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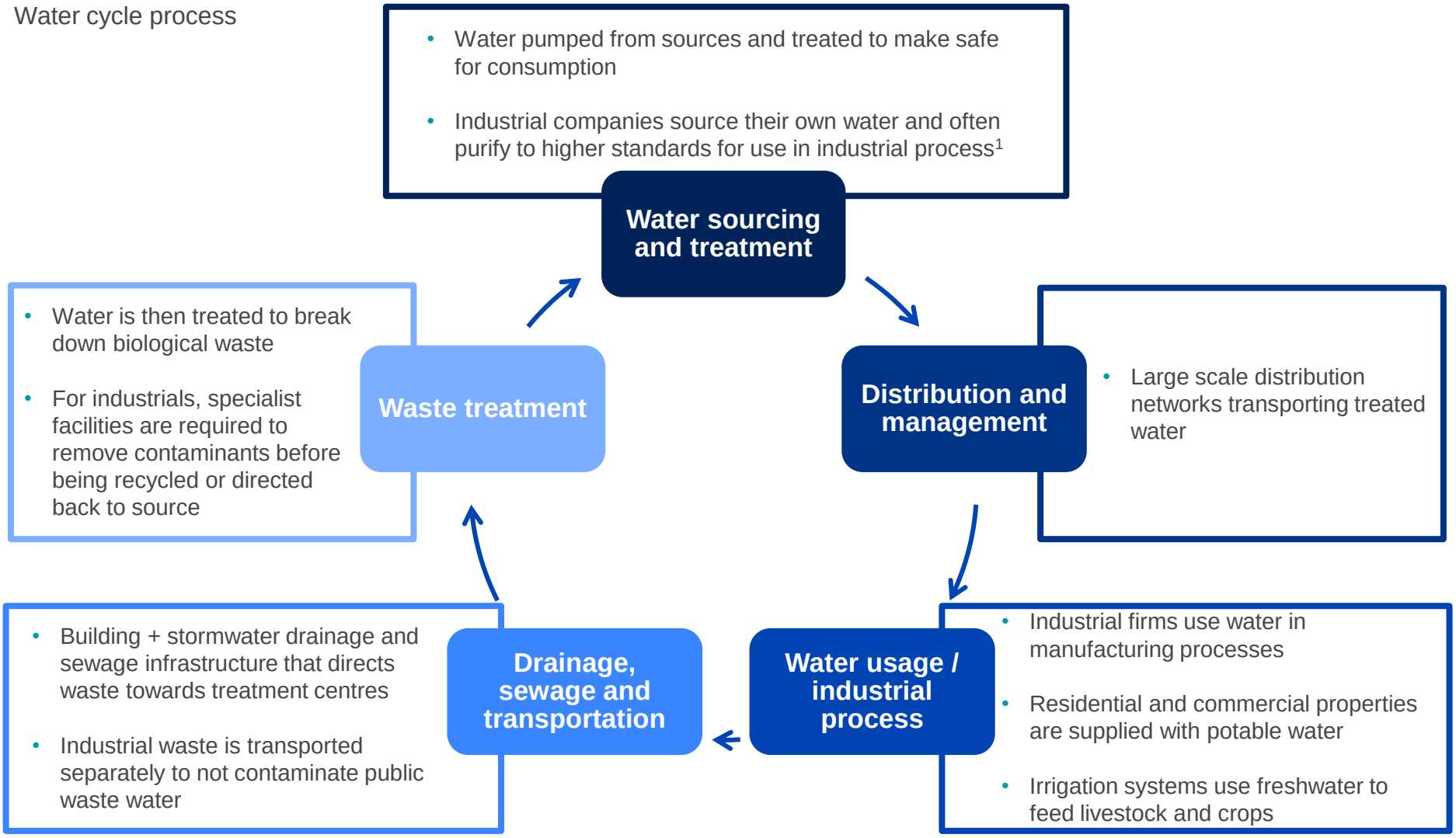
Plural's water management coverage spans the full supply chain from sourcing and treatment to waste treatment across municipal, industrial and commercial

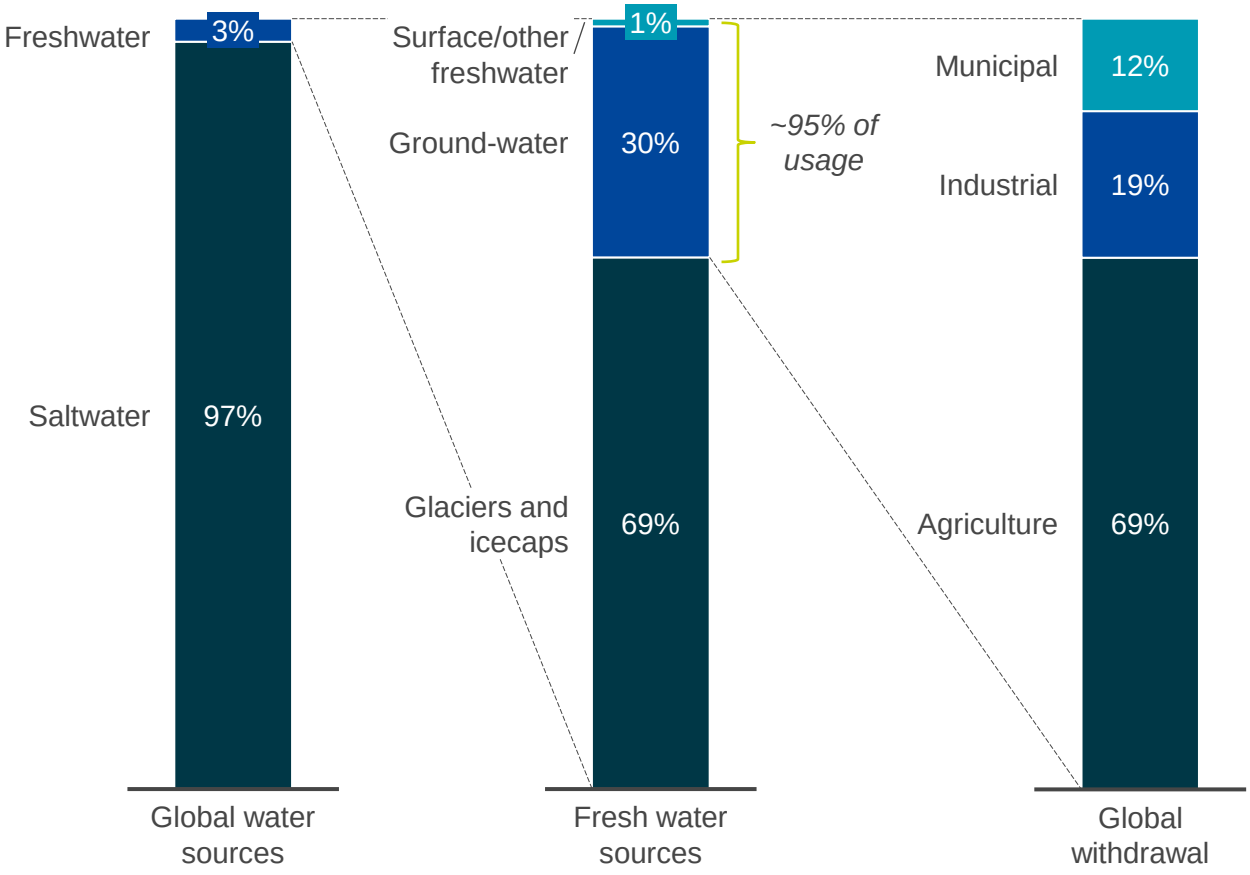
Water cycle process



[1]High levels of water purity are necessary for pharmaceutical/medical, and food & beverage industries

Agriculture accounts for ~70% of water withdrawal globally. The industrial and municipal sectors make up the rest

Water broken down by source and user



- Public drinking water
- Non-consumption and sewage
- Thermoelectric power production

- Coolant for manufacturing
- Direct component in consumer products ie pharmaceuticals, food and beverage, textiles

- Livestock
- Crops
- Aquaculture

Source: International food policy research: Global water outlook, USGS, FAO, Plural analysis

Water technology investment is driven by strong underlying drivers of developing and aging infrastructure, technology integration and environmental factors

Macro drivers for water technology investment

Investment driver		Key end market	Commentary
New infrastructure and need to modernize networks		• Municipal	• Aging infrastructure and urban population growth driving government investment in both developed and developing markets
Reduce cost base and efficiency of water usage		• Municipal • Industrial • Commercial / residential • Agriculture	• Technology and analytics integration decreases water waste and usage • New and more effective waste filtration for nutrients and minerals reclamation
Environmental factors	Regulation / social image	• Industrial • Municipal • Commercial • Agriculture	• Between 5-20% of Americans are believed to have been exposed to unsafe drinking water in the last decade driving increasingly stringent regulation • 96% of corporations feel public pressure to become more sustainable
	Water scarcity	• Industrial • Municipal • Commercial • Agriculture	• More frequent droughts and increasing global usage is driving scarcity solutions • Under current trends, demand for water will exceed supply by 40% in 2030 driving recycling solutions and new low consumption processes
	Poor water quality	• Industrial • Municipal • Commercial / residential • Agriculture	• Flooding, agricultural run-off, sewage and industrial byproducts are contaminating water sources and increasing the need for treatment and stormwater infrastructure • Poor infrastructure is increasing need for in home filtration

[1]Note: The 2016 US administration rolled back some standards, but this is likely to be short term
Source: Greenmoney, FMI research reports, Deloitte, Oxford economics, HSBC, News21, Plural analysis

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There are 4 major end markets for water management products

End markets

Require solutions for every stage of the water process

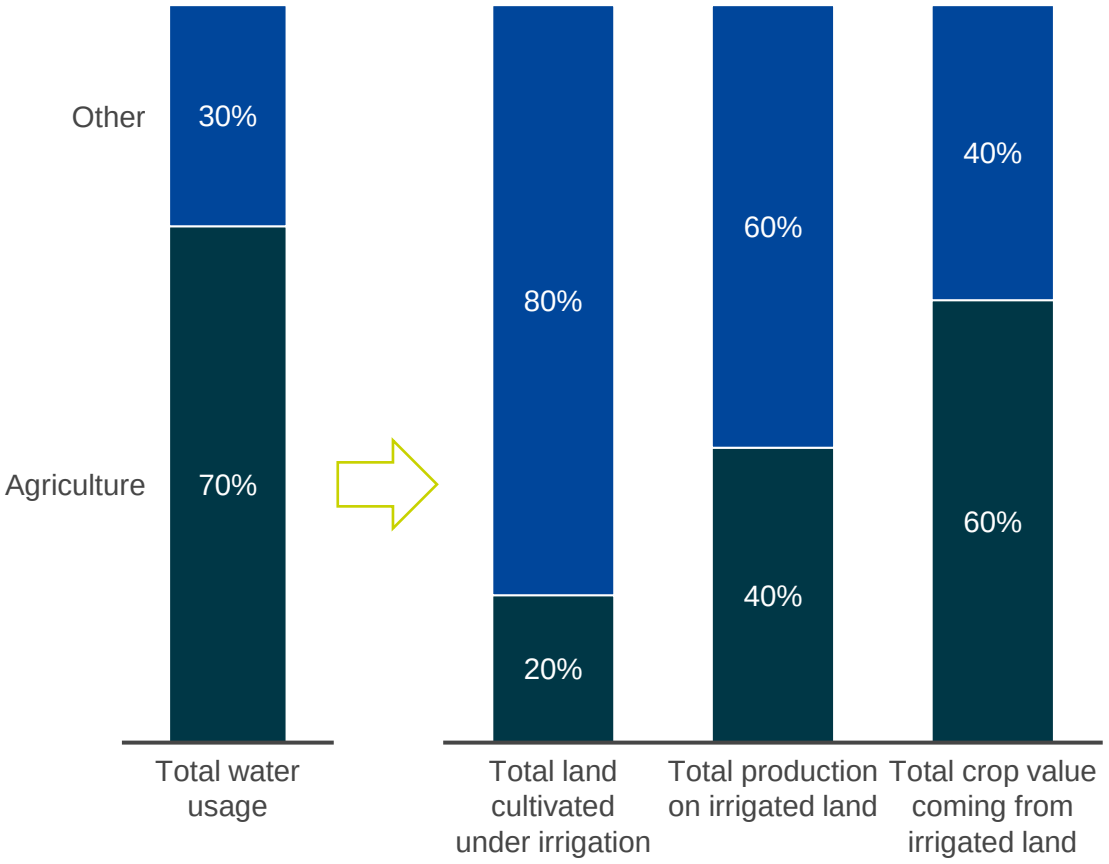
Require solutions related to point of use

Agriculture	Industrial	Municipal	Residential and commercial

• Irrigation
• Livestock
• Aquaculture
	• Chemicals
	• Electronics
	• Food and Beverages
	• Mining
	• Oil and gas
	• Pulp and paper
	• Textiles
		• Thermoelectric power
		• Water utilities
		• Wastewater utilities
			• Residential homes
			• Commercial, e.g.
			  • Hospitals
			  • Offices
			  • Public spaces
			  • Prisons
			  • Retail stores
			  • Schools

Agriculture will need to invest in efficient water technology given the higher productivity and increasing competition for water from other use segments

Agriculture use of water and effectiveness of irrigated land



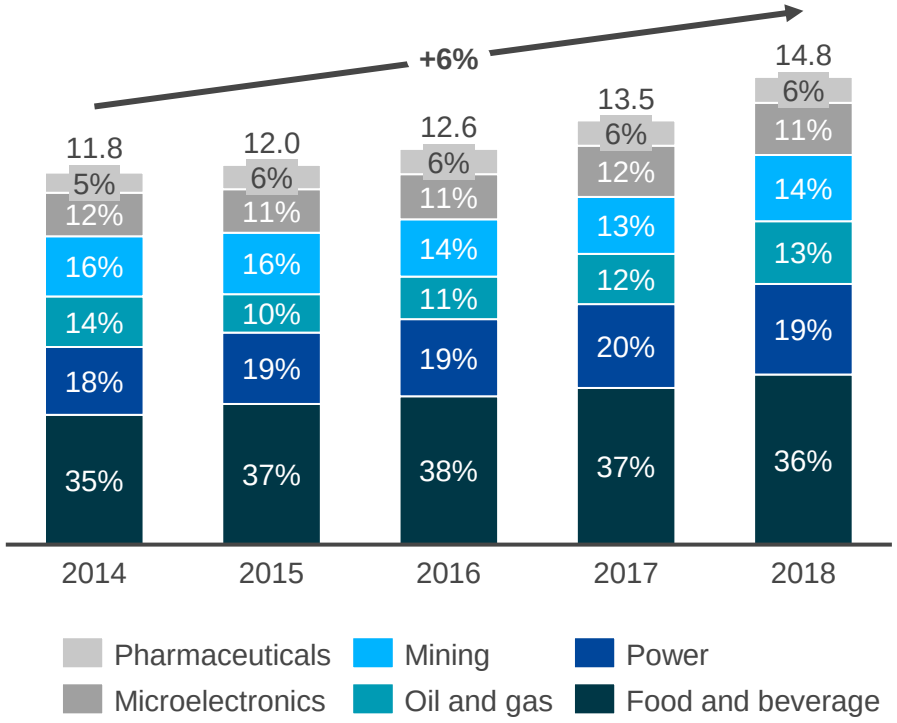
Drivers / barriers

- Agriculture has experienced a recession since 2014 which has suppressed investment in equipment
- Long term agricultural output needs to double by 2050 and agriculture will face increasing competition for water from other needs such as urban growth. This means it needs to use water more efficiently
- **Automated irrigation –** Irrigation is a focus point for water scarcity. As the largest withdrawal of water globally, new technologies that increase efficiency and output offer significant growth potential
- **Aquaculture –** Aquaculture is transitioning into more efficient farmed methods requiring storage and water treatment solutions

Source: GWI, MOWI Salmon farming industry handbook, Plural analysis

Waste regulation and high purity need are driving investment in the industrial segment

Industrial water treatment investment by end markets, 2014-18, $bn



CAGR, 2014-18

7%
6%
5%
6%
5%
7%

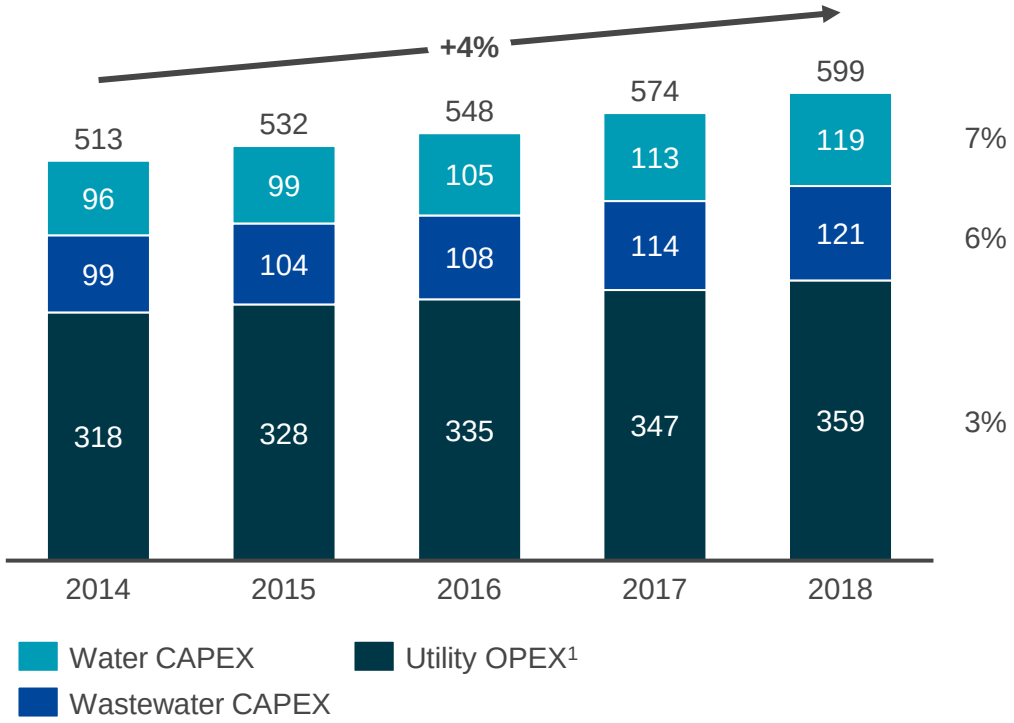
Drivers / barriers

- Regulatory pressure on industrial wastewater is increasing investment into treatment and re-use technology
- High growth potential in treatment technology due to level of purification needed in Electronics, Pharmaceuticals and Food and Beverage
- Wash-down and general water usage is a huge production cost in sectors such as food and beverage
- Desalination technology gives the opportunity for coastal industries to move away from freshwater

[1]OPEX is the operational expenditure, [2]Residential and commercial water treatment equipment
Source: GWI, Plural analysis

Developing and aging infrastructure are strong drivers for municipal water and wastewater investment

Municipal water investment by end markets, 2014-18, $bn



CAGR, 2014-18

7%

6%

3%

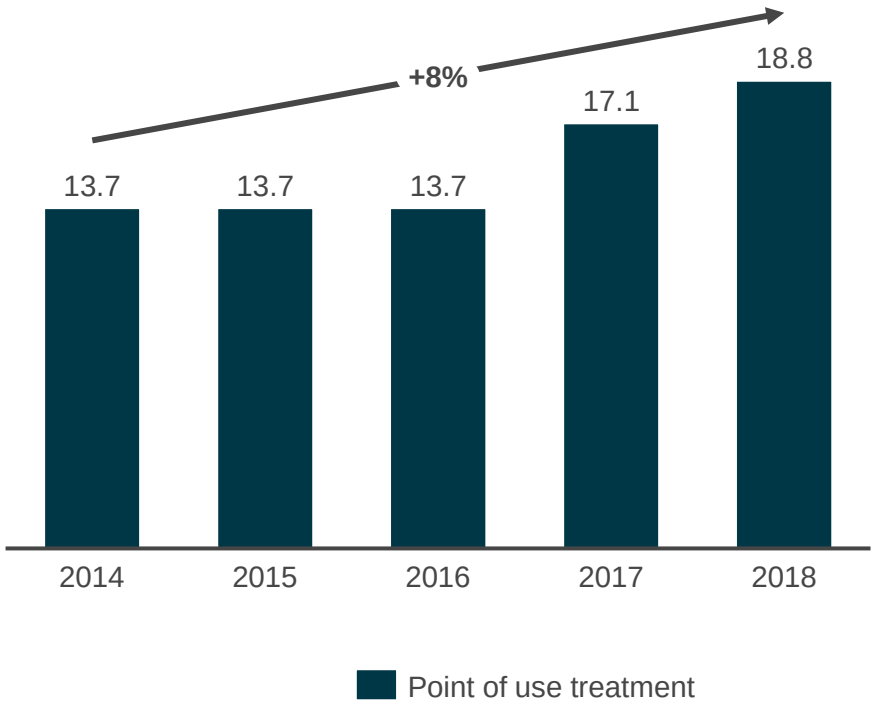
Underlying drivers / barriers

- Urban population growth, water scarcity and aging infrastructure are key investment drivers
- Estimated $14bn of water is lost by utilities
- Corrosion of old copper and lead pipes is leading to water pollution during transportation to homes
- An estimated $1tr in investment is needed in the US pipe infrastructure over the next 25 years
- High growth potential in technology solutions to increase water efficiency and predict pollution occurrence
- However, growth is highly dependent on municipal spend which is typically reliant on central government funding

[1]OPEX is the operational expenditure, [2]Residential and commercial water treatment equipment
Source: World bank, GWI, Delloitte, Plural analysis

Significant growth in point of use water treatment as water pollution becomes more of a concern to residential and commercial end markets

Residential and Commercial point of use water treatment, 2014-18, $bn



CAGR, 2014-18

8%

Comments

- Awareness around the impact of water pollution on health is driving increase investment in point of use treatment systems
- Technology innovation is allowing more complex water treatment in commercial and residential properties
- Smart technology is driving more efficient water usage in buildings
- High growth potential in UV and Reverse Osmosis technology
- High growth potential in water dispenser market

Source: Grand view research, GWI, Plural analysis

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The water management technology sector can be broken up into 5 major categories with sub-product groups that are sold across multiple end markets

Water management technology segments

Water and waste treatment	Flow control	Infrastructure	Point of Use (PoU)	Smart technology

• Membrane filters
• Chemical treatment
• Non-filter purification systems (UV, electrodialysis, deionisation)
	• Pumps
	• Valves and controls
	• Storage
	• Irrigation equipment (sprinklers and drips)
		• Full utility[2]
		• Pipes and drains
		• Waste transportation
		• Construction and maintenance
			• Sanitary appliances
			• Heating products
			• Point of use treatment[1]:
			  • Filters / RO
			  • Chemicals
			  • Non-filter purification
				• Automation systems
				• Smart buildings / meters
				• Leak detection / pipe inspection
				• Performance analytics / software
				• Water treatment innovation
				• Level sensors / monitors

[1]In building purification systems
[2] Utility offers a management service of pipes, valves and metering, and billing for public usage

Water and waste treatment products offer investment opportunities in strong growth markets with high levels of fragmentation

Sub-product categories

		CAGR, 2019-23	Market fragmentation	Market disruption	Comments
Water and waste treatment	Filters	7-9%	Medium	High	• Strong growth in RO filters due to efficiency in desalination and general treatment • High disruption i.e self cleaning, stronger membranes
	Non-filter	5-7%	Medium	High	• Strong growth in UV purification for food and beverage, and medical sector • Fragmentation in residential market
	Chemical	4-6%	Medium	Medium	• Strong growth in coagulants and flocculants • Treatment systems moving away from chemicals • Average consolidation under major companies
Flow control	Pumps	5-7%	Low	Low	• Growth in emerging markets from rapid industrialisation • Growth in technology to separate liquids and gases • Power generation and municipal are key end markets
	Valves and controls	6-8%	Medium	Medium	• Driven by construction activity • Growth in pivot control systems for agriculture • Consolidated market for municipal focused solutions
	Storage	5-7%	Medium	Low	• High demand in oil and gas for hydraulic fracturing storage equipment • Top 22 players account for ~35% of market
	Irrigation equipment	10-12%	Low	Medium	• Highest growth in centre pivot irrigation due to efficiency and combination with data analytics • Growth in drip irrigation

Note: Forecast growth rates vary between sources and by end market / product category
Source: Allied Market research, marketsandmarkets, psmarketresearch, grandviewresearch, Mordor Intelligence, businesswire, Plural insights

Point of use treatment systems will likely be an attractive market due to high market fragmentation and growing demand

Sub-product categories

		CAGR, 2019-23	Market fragmentation	Market disruption	Comments
Infrastructure	Pipes and drains	7-9%	Medium	Medium	• PVC piping will offer the greatest growth opportunities due to it's anti-corrosion properties • Driven by municipal construction activity
	Waste transportation	5-7%	Medium	Medium	• Industrial waste collection is highly regulated • Significant merger activity in oil and gas waste water pipelines
	Construction and maintenance services	2-4%	Low – Medium	High	• Aging infrastructure driving high municipal spending • Manual maintenance checks are getting replaced with digital solutions
PoU	Sanitary appliances	4-6%	Low	Low – Medium	• Strong growth due to construction in emerging market • Smart faucets causing disruption
	Heating products	3-5%	Low – Medium	Medium	• Market innovation to improve efficiency • Strong growth in underfloor heating • Moderate market fragmentation
	Point of use water treatment	8-10%	High	High	• Strong growth in home water dispensers • Strong growth in RO purifiers and UV purification

Note: Forecast growth rates vary between sources and will have a margin of error of ~1%
Source: Allied Market research, marketsandmarkets, psmarketresearch, grandviewresearch, Mordor Intelligence, IBIS world, Plural insights

Smart water technology is a cause of high disruption across many markets but is quickly becoming consolidated among major players

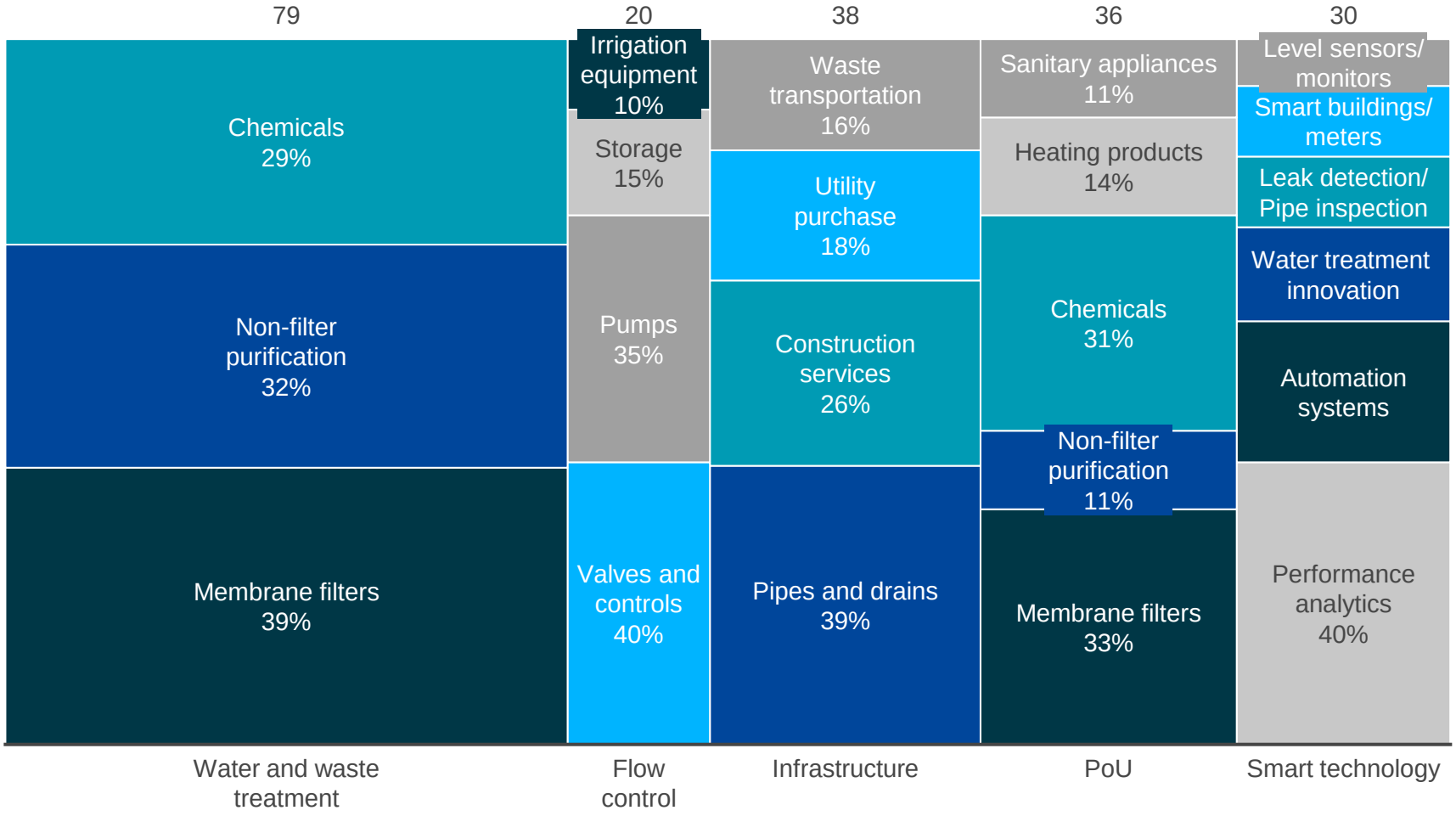
Sub-product categories

		CAGR, 2019-23	Market fragmentation	Market disruption	Comments
Smart technology	Automation systems	11-13%	Low	Medium	• Consolidated market • Municipal focused digital solutions
	Smart buildings / meters	9-11%	Low	Medium	• Strong complementary product to utilities and infrastructure corporates • Few independent companies offering solutions
	Leak detection / pipe inspection	6-8%	Medium	High	• High competition between major technology companies • Sensors replacing manual inspection methods
	Performance analytics and software	11-13%	Medium – High	High	• AI integration to alert of pollution events • High industrial and agriculture demand due to efficiency • Fragmented but undergoing consolidation
	Specialist innovations	> 8%	High	High	• Strong growth in atmospheric water generators and renewable energy integrated systems • Niche solutions to water and energy scarcity
	Level sensors / monitors	6-8%	Low	High	• Transition from contact to non-contact electronic sensors • Highly consolidated but increasing competition

Note: Forecast growth rates vary between sources and will have a margin of error of ~1%
Source: Allied Market research, marketsandmarkets.com, grandviewresearch, psmarketresearch.com, Mordor Intelligence, Plural insights

Water and waste treatment has been an attractive area of investment for PE investors since 2015. There is significant activity in both large scale and PoU

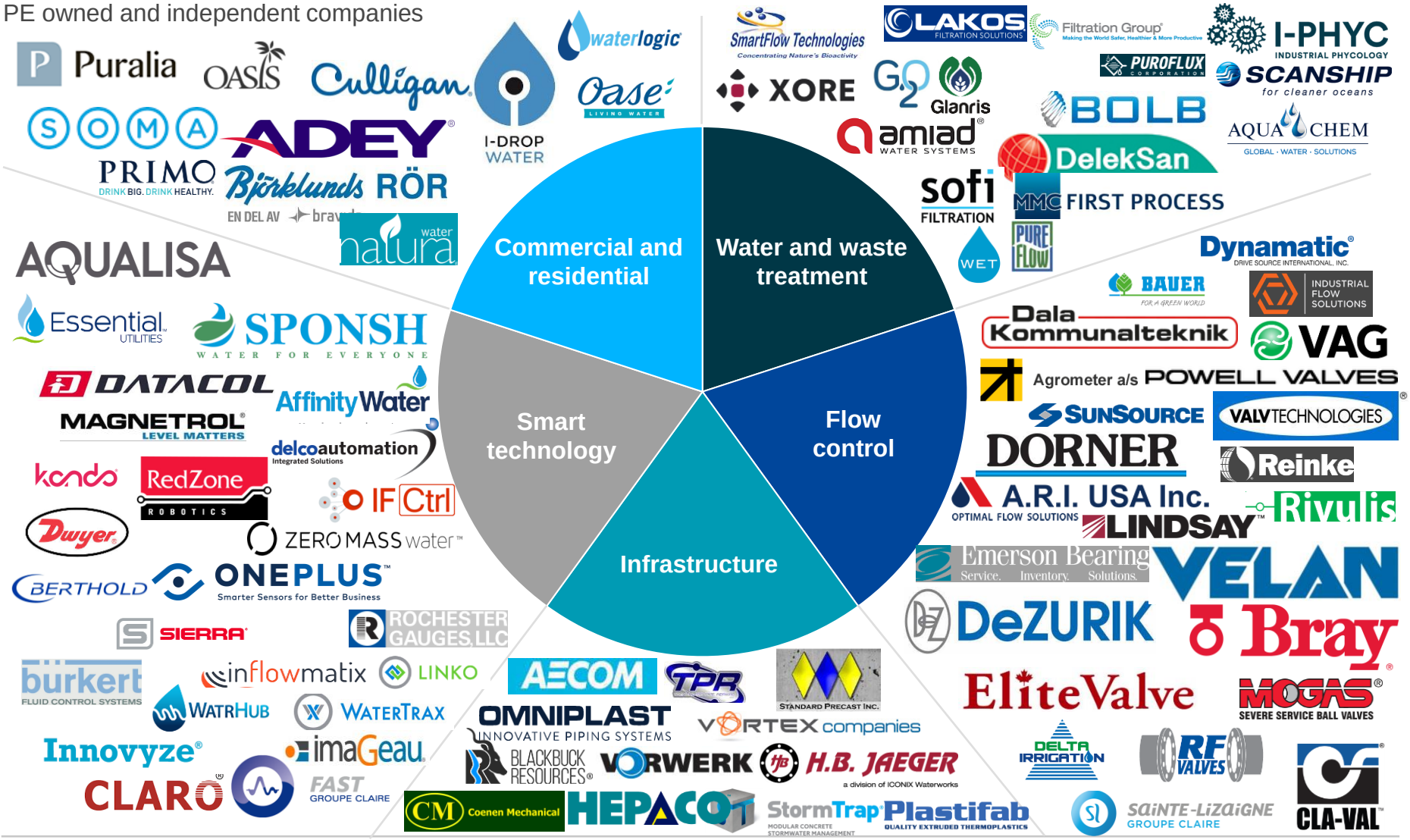
PE merger activity, number of deals by segment - 2015-2020



Note: Sample of 200 PE mergers and acquisitions
Source: Pitchbook, Plural analysis

Example PE owned and independent companies operating in the water management sector

PE owned and independent companies



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Recent M&A activity covers all the stages of the water cycle and is split by new technology and improvements on existing products

Growth areas and products

	Generally technology developments	Smart technology developments
Water and waste treatment	• Better filtration membranes • Self cleaning filters • UV purification • Recyclable and improved chemicals • Marine industrial solutions	• Water from atmosphere extractor (AWG)
Flow control	• Valves, control valves and actuators • Pump • Bearings • Center pivot and drip irrigation	• Float level sensors and instruments
Infrastructure	• Pipe improvements • Hazardous waste services • Trenchless pipe lining and replacements	• Automation technology • Leak detection • Performance analytics
Commercial and residential	• Point of use filters and non-filters • Point of use chemical treatment • Water dispensers • Boilers and heating services	• Smart meters • Front of wall technology integration

[1]In building purification systems, [2]utility offers a management service of pipes, valves and metering, incorporation of new

Water and waste treatment M&A activity and developments, 2015-2020

	Technology area	Key use industries	Description	Maturity	Example companies
Water and waste treatment	**Better filtration membranes**	• Industrial • Municipalities / Utilities	• Reverse osmosis is the most common form of water treatment • Development in filters include using new materials such as graphene	Medium	LAKOS FILTRATION SOLUTIONS, G2, SmartFlow Technologies, Glanris, AQUA CHEM GLOBAL · WATER · SOLUTIONS, Filtration Group, PUROFLUX CORPORATION
	Self cleaning filters	• Industrial • Municipalities / Utilities	• Filters that can provide self maintenance and increase water re-circulation rates	Low	amiad WATER SYSTEMS, sofi FILTRATION

	UV purification	• Public drinking water
		• Medical / Pharma
		• Electronics
		• Food and beverage
			• UV lights can be used to purify water:
			  • is highly effective against pathogens
			  • doesn't result in harmful byproducts or pose risks to marine life
				Low	BOLB, PURE FLOW

	Recyclable and improved chemical	• Mining and metal work • Agriculture • Power and Electronics	• Recyclable chemicals compounds and specialist algae for biological matter • General chemicals can separate toxic byproducts and rebalance pH levels	Medium	DelekSan, I-PHYC INDUSTRIAL PHYCOLOGY
	Marine industrial solution	• Commercial marine vessels • Aquaculture	• Full desalination and waste treatment equipment for marine vessels • Fish storage, piping and water treatment	Medium	WET, SCANSHIP for cleaner oceans, MMC FIRST PROCESS
Smart technology	**Water from atmosphere extractor (AWG)**	• Residential homes • Community solar farm	• Use of panels to extract water in the atmosphere as a method of overcoming water scarcity issues in remote locations • Growth estimates for the segment are >20%	Low	SPONSH WATER FOR EVERYONE, ZERO MASS water™, HENDRX KNOW WHAT YOU'RE DRINKING!

Source: Pitchbook, Plural analysis

Flow control treatment M&A activity and developments, 2015-2020

	Technology area	Key use industries	Description	Maturity	Example companies
Flow control	**Valves, control valves and actuators**	• Industrial • Municipalities / Utilities	• Range of mechanical valves (ie butterfly, gate, knife gate, control) • Control valves operate remotely or automatically to adjust flow rate	Medium	DeZURIK, DORNER, VAG, Bray, VALVTECHNOLOGIES, MOGAS, POWELL VALVES, SUNSOURCE, SAINTE-LIZAIGNE, VAL-MATIC, EliteValve, A.R.I. USA Inc.
	Bearings	• Municipalities / utilities • Industrials	• Bearings are used to continuously rotate pipes and sludge vats in order to separate water from waste	Medium – High	Emerson Bearing Service. Inventory. Solutions.
	Centre pivot and drip Irrigation	• Agriculture	• Center pivot irrigation offers highest efficiency of land and water usage • Drip irrigation offers a cheaper alternative where tubes are thread through crop fields • Incorporated with data tracking technology	Low – Medium	Rivulis, DELTA IRRIGATION, Reinke, LINDSAY
	Pumping systems	• Agriculture • Sewage • Water extraction	• Waste slurry pumping systems that offer more environmentally friendly processes to meet regulation • Some systems can be fully submersible	Medium – High	Dala Kommunalteknik, Agrometer a/s, BAUER, INDUSTRIAL FLOW SOLUTIONS, Dynamatic
Smart technology	**Float level sensors and instruments**	• Municipalities / utilities • Industrials	• Sensors that can actively track water levels of tanks and the chemical properties of the stored water electronically	Low	Dwyer, BERTHOLD, ONEPLUS, SIERRA, burkert FLUID CONTROL SYSTEMS, ROCHESTER GAUGES, LLC

Source: Pitchbook, Plural analysis

Water infrastructure M&A activity and developments, 2015-2020

	Technology area	Key use industries	Description	Maturity	Example companies
Infrastructure	Stormwater detention and filtration	• Municipalities / utilities • Industrials • Commercial	• Detention products filter and store stormwater to be returned to soil or sewage at a controlled rate	Medium	StormTrap
	Hazardous waste services	• Manufacturing • Oil & gas • Pharmaceutical • Paper and textile	• Oil and gas wastewater pipelines • Industrial hazardous waste disposal services • Emergency cleanup services	Medium	Vorwerk, HEPACO, Blackbuck Resources
	Trenchless pipe lining and replacement	• Municipalities / utilities	• Previous pipe infrastructure required roads and other infrastructure to be dug up • New trenchless piping can replace or repair pipes at ground level	Low	Vortex companies, TPR
Smart technology	Automation technology	• Municipalities / utilities • Industrials	• The company's software offers automation of loop tuning instruments, process control, electrical panel products	Low – Medium	delcoautomation Integrated Solutions, IF Ctrl
	Leak detection	• Municipalities / utilities	• Sensors in water pipes are being integrated to alert real time infrastructure damage • Companies offering a manual checking service are falling in demand	Low	RedZone Robotics, FAST Groupe Claire
	Performance analytics	• Municipalities / utilities • Industrials • Agriculture	• Software that tracks the usage of water and provides analytics • Some products give information on a probability of pollution events	Low	WaterTrax, WatrHub, inflowmatix, imaGeau, Innovyze, LINKO, kando

Source: Pitchbook, Plural analysis

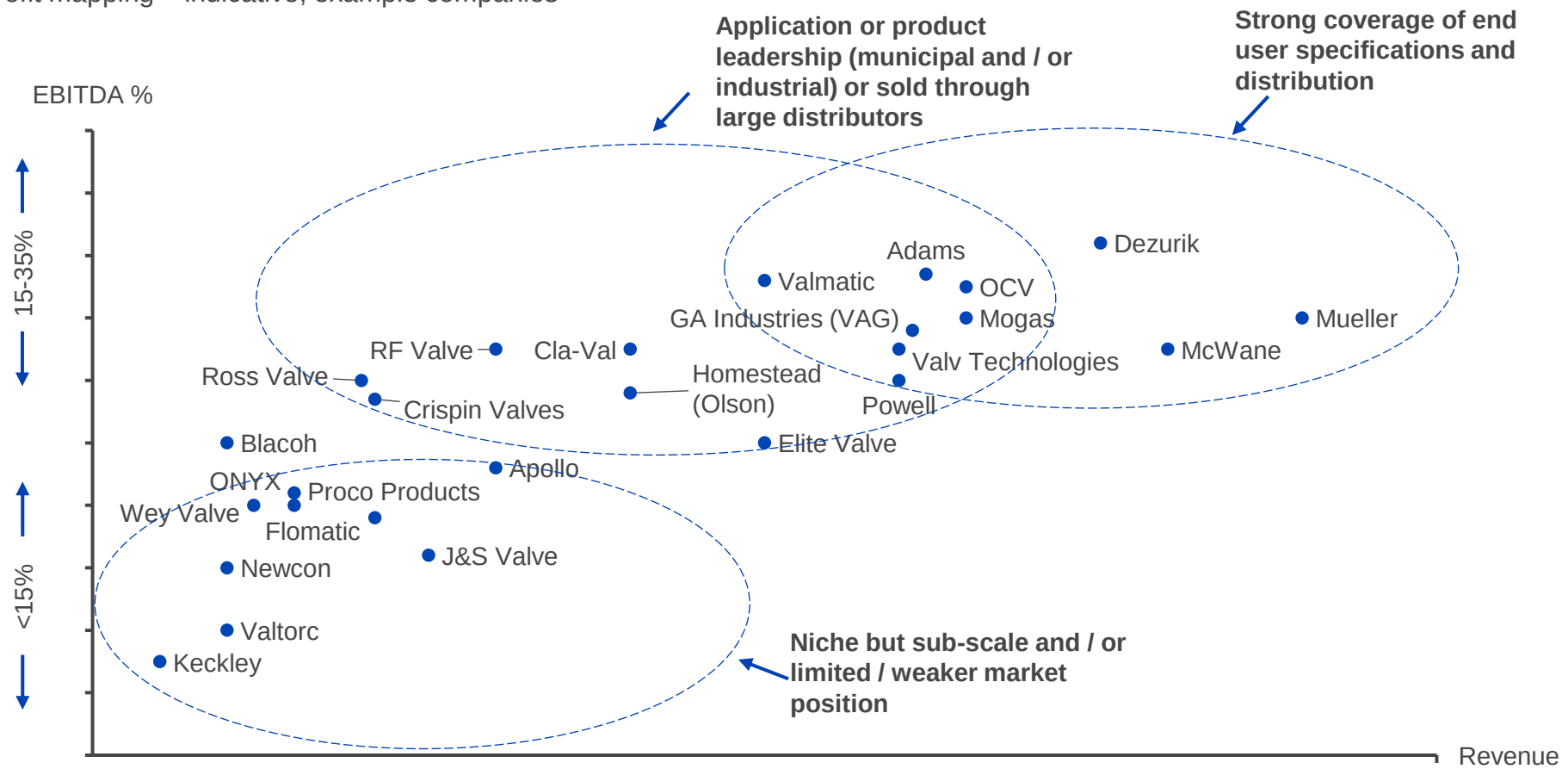
Residential and commercial M&A activity and developments, 2015-2020

	Technology area	Key use industries	Description	Maturity	Example companies
Residential and commercial	**Point of use filters and non-filtration**	• Households • Commercial buildings	• Public home treatment is becoming more widely used • UV purification and home filters	Low	SOMA, Culligan, Puralia
	Point of use chemical treatment	• Households • Commercial	• Companies offering home chemicals such as softeners and water systems • Chemicals for drinking water, pools and ponds	Medium – High	Culligan, Oase
	Water dispensers	• Residential and Commercial • Commercial properties in emerging markets	• Water dispensers are increasingly used to produce bottled quality without plastic waste • Initiative have been set up in emerging economies as an alternative access to water	Medium	natura water, PRIMO, I-DROP WATER, waterlogic, OASIS
	Boilers and heating services	• Commercial buildings • Residential houses	• New more efficient heating equipment • Some new equipment is capable of self cleaning and so reduce need for maintenance	Medium	ADEY, Björklunds RÖR, EN DEL AV bravida
Smart technology	**Smart meters**	• Utilities • Residential and commercial	• Metering services all usually installed through a utility • Allows customers to reduce consumption and utilities to track usage data	Medium	DATACOL, Badger Meter, Essential UTILITIES
	Front of wall technology integration	• Households • Public showers / toilets	• Technology integrate showers and taps that relay usage data • Taps capable of producing boiling, carbonated and cold water directly	Low	AQUALISA

Source: Pitchbook, Plural analysis

Case study – US water / wastewater valves: Profit is driven by strong exposure to municipal specifications, distribution channels or application expertise

Profit mapping – indicative, example companies[1]



Note: [1]EBITDA % is only known for Mueller Co and DeZURIK. For other companies it is directional based on size + application and / or product specialization
Source: Plural interviews and analysis

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