WATER INSIGHT

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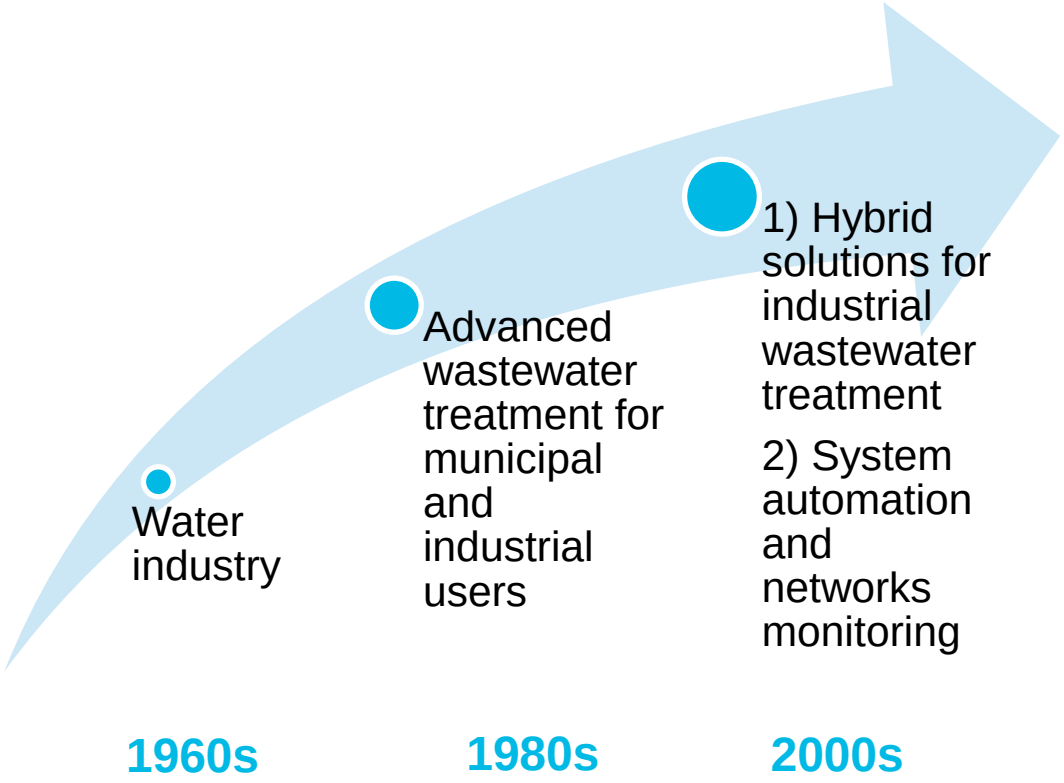
INNOVATION IN THE WATER SECTOR HAS SHIFTED FROM THE WATER TREATMENT INDUSTRY TO INTEGRATED SOLUTIONS

- Innovation originally came from large engineering firms focused on municipal water
- In the past 10 years disruptive technologies have shifted the focus to industrial wastewater treatment
- System automation and networks monitoring are the next frontiers



USE OF MEMBRANES IN THE PAST 30 YEARS

GRADUAL TECH IMPROVEMENTS HAVE BENEFITED MULTIPLE SECTORS

- Early days: Use in municipal WWTP
- Today's opportunities:
  - Reuse
  - Desalination

MEMBRANE TYPES AND USES

Types:

- Microfiltration > ultrafiltration > nanofiltration
- Reverse osmosis

Uses:

- Membrane bioreactors
- Filtration
- Disinfection
- Desalination

BREAKTHROUGH TECHNOLOGIES FOR WASTEWATER TREATMENT APPLICATIONS

ENERGY SAVING TECHNOLOGIES

- Microbial fuel cells
- Demand-side efficiency measures
- Energy recovery from anaerobic digestion of wastewater sludge

OPPORTUNITY

- Electricity accounts for 25-40% of operating costs for wastewater treatment
- This represents 1.5% of total US electricity consumption
- Wastewater treatment capacity will grow by up to 8% each year over the next decade

Source: US EPA, California Energy Commission, Bloomberg New Energy Finance

WATER DISTRIBUTION NETWORKS

WATER SAVING OPPORTUNITIES...

- Leakage reduction and network monitoring:

- curapipe : Automated leakage
- TaKaDu : Real-time control over network events and losses

...THAT COUNT!

- Losses are important:
  - US: 22.4 million m^3/d (20% of consumption)
  - UK: 3.6 million m^3/d (25% of consumption)
- Benchmarks:
  - 20 million m^3/d: 2 times the water demand in Beijing + Shanghai in 2010
  - 3 million m^3/d: desalination capacity in China in 2020

Source: Bloomberg New Energy Finance

SUMMARY

- Innovation in the water sector has shifted from large players focusing predominantly on the utilities sector to start-ups targeting multi-sector water and wastewater treatment solutions
- Leaders in water innovation address problems of energy efficiency and recovery for both municipal and industrial effluent treatment plants
- Innovations that address challenges such as leakage detection, systems demand and supply balances and network automation are invaluable for water utilities

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