

ACCELERATING INVESTMENT

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Watering the New Economy

Panel Moderator

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To receive a recap of the presentation, register here





Data centre market boom



Global market

- 2025: \$591m
- 2030: \$1,053m
- 5-year CAGR: 12.2%

Growth drivers

- Sector buildout
- Continued use of water cooling
- Alternative / nonpotable water sources
- Sub-optimal sites
- Water efficiency



Impacts on power generation



Capacity

- Combined cycle gas buildout
- Maintenance of coal fired capacity

Onsite generation

- Simple cycle gas
- Small modular reactor buildout not expected until after 2035

---Nuclear

Co-location

- Power plants and data centres increasingly colocated
- Shared water treatment infrastructure



Regional outlook – Water CAPEX for Semiconductor, 2025-2030





Regional outlook for water capex in the mining industry, 2025-2030



Global Market

2025: \$20.1b 2030: \$26.1b 5-year CAGR: 5.4%

Growth Drivers

- Mineral demand
- Competition for source water
- Lower grade ores
- Pressure for safer tailings management

2025 2030 x 5-year CAGR (%)









Water and Mining Interactions

Primary issues:

- •A large footprint of disturbance with multiple water interactions.
- •Water can become a focal point for broader issues.
- •Water is a key strategic enabler and a significant risk if not proactively managed.

How do we manage it:

- •Adopt a risk-based approach (ICMM).
- •Manage at a catchment scale
- •Engage and work with others.
- •Consider closure and water designs from the start.
- •Technology to reduce water consumption and decrease demand.





Watering the New Economy - Micron

Deena Starkel

Member Technical Staff (MTS Water Engineer) Global Water Summit May 2025





Al is everywhere



Autonomous vehicles



Personal and workplace productivity



Healthcare



Learning



Climate and natural disaster prediction



Smart manufacturing

Micron innovations accelerate artificial intelligence





Al in the data center

Micron memory and storage solutions lead in performance, power efficiency and capacity across the memory/storage hierarchy in the data center

Al at the edge

Micron's industry-leading, low-power memory and universal flash storage solutions unleash new Al-enabled personalized user experiences

Everywhere there's AI, there's Micron



Gen AI demands of data center and cloud infrastructure

High-performance, high-bandwidth memory and storage address bottlenecks in the data center



Performance

Generative AI and advanced AI applications achieve <50% of peak processor performance due to memory bottlenecks¹



Capacity

Datasets, LLMs and workloads continue to grow exponentially, requiring multiple servers to support



Power

Data centers consume ~3% of the world's electricity and are expected to reach >8% by 2030²

Micron's U.S. leading-edge memory manufacturing investments

Boise, Idaho

- Plans to invest approximately \$15 billion through the end of the decade to construct a new fab for leading-edge memory manufacturing in Boise, Idaho
- Co-locates Micron R&D and manufacturing, which will enhance operational efficiency, accelerate technology deployment and improve time to market
- Ultimately, the cleanroom space will reach 600,000 square feet the size of approximately 10 U.S. football fields
- Will create thousands of Idaho jobs, including approximately 2,000 Micron jobs, 4,500 construction jobs and over 15,000 indirect jobs over the next 20-plus years

Clay, New York

- Plans to invest up to \$100 billion over the next 20-plus years to construct a new leading-edge memory manufacturing megafab in Clay, New York
- Site could eventually include four 600,000 square foot cleanrooms, for a total of 2.4 million square feet of cleanroom space – the size of approximately 40 U.S. football fields
- Will create thousands of New York jobs, including approximately 9,000 Micron jobs, 4,500 construction jobs and 40,000 indirect jobs over the next 20-plus years
- Micron and the state of New York are investing \$500 million in community and workforce development over the duration of the project



Micron Water Sustainability



Progress toward water stewardship goal

water reused, recycled and restored

Water use and recycle Water volume in million m³



All data is for the calendar year. Detailed figure can be found in **Performance at a glance**.

Data center water demands of AI

Water Demand

- Industry is ~37% of total freshwater withdrawals in the US
 - 86% is for Power Production
 - 14% all others (see chart)
- DCs: <1% of total industrial demand in US
- Businesses with water withdrawal reduction goals: doubled since 2022

Improving Water Efficiency for AI growth

- Datacenter Industry efficiency gains
 - AWS has reduced water use / kWh every year since 2020
- Advances in material science (chips, data storage)
- Liquid Cooling Technologies

2024 Annual Industrial Water Use Excl Power Industry (BN Liters, US and Canada)



Source: Bluefield Research, Nov 2024





Data Center Sustainability Efforts

Focus is showing results

- 100% renewable power efforts driving down water use
 - Embedded water use in power production down 20% since 2015 (US)
 - Wind and Solar lowest intensity
- Water Reuse Investment
 - AWS using recycled water at 24 DCs globally and growing!
 - Advancing Water Reuse Act
- Growing Use of Scalable AI Tools
 - Utility system leak reduction, pressure management
 - Soil monitoring and optimization
 - Industrial facility fleet management





Salt River Project

Christa McJunkin

Senior Director of Water Supply & System

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What is SRP?

- One of the nation's largest public power utilities
- Provide reliable, affordable water and power to more than
 2 Million people
- The largest raw-water supplier in the Valley, delivering about **800,000** acre-feet of water annually
- Managing a **13,000** square-mile watershed





Mission Statement

SRP serves our customers and communities by providing reliable, affordable and sustainable water and energy.



Data Center Growth

- Phoenix ranks 4th among North American data center markets
- SRP serves power to over half of Phoenix data centers
- Load associated with data centers is forecasted to increase over 7 times over the next 10 years
- Water demand for data centers is a key consideration in arid environments



Water & Data Centers

- State tax incentives attract data centers
- Local water providers can have issues with water resource demand and wastewater quality
- Data center design needs to adapt to the local environment

Semiconductor World



Source: IRDS Water Circularity Working Group FTD solutions

The old way of managing water: simple and relatively risk free

• Once through the site...



Source: IRDS Water Circularity Working Group FTD solutions



unbalanced circularity

Industrial Automation Architecture



Industrial Automation future with examples

Image-to-text translation (2)





30x PTZ Camera for capturing images Images are translated to text and saved for analytics



Chem Tote Bay - Change Detection (Tote Missing)

Acoustic Imaging (6)





Diaphragm Leak Check



AODD Pump Leak Check



CDM Plumbing Leak Check

Acoustic Imager for capturing gas/air leaks Leaks are captured and saved for review



RO Skid Leak Check





Motor Bearings **Temperature Check**





Filter Check





FLIR IR Camera for capturing thermal images

Thermal images are translated to text and saved for analytics



UV

VFD

Filter Check

Filter Check



ASD Filter Check



UVR Filter Check

