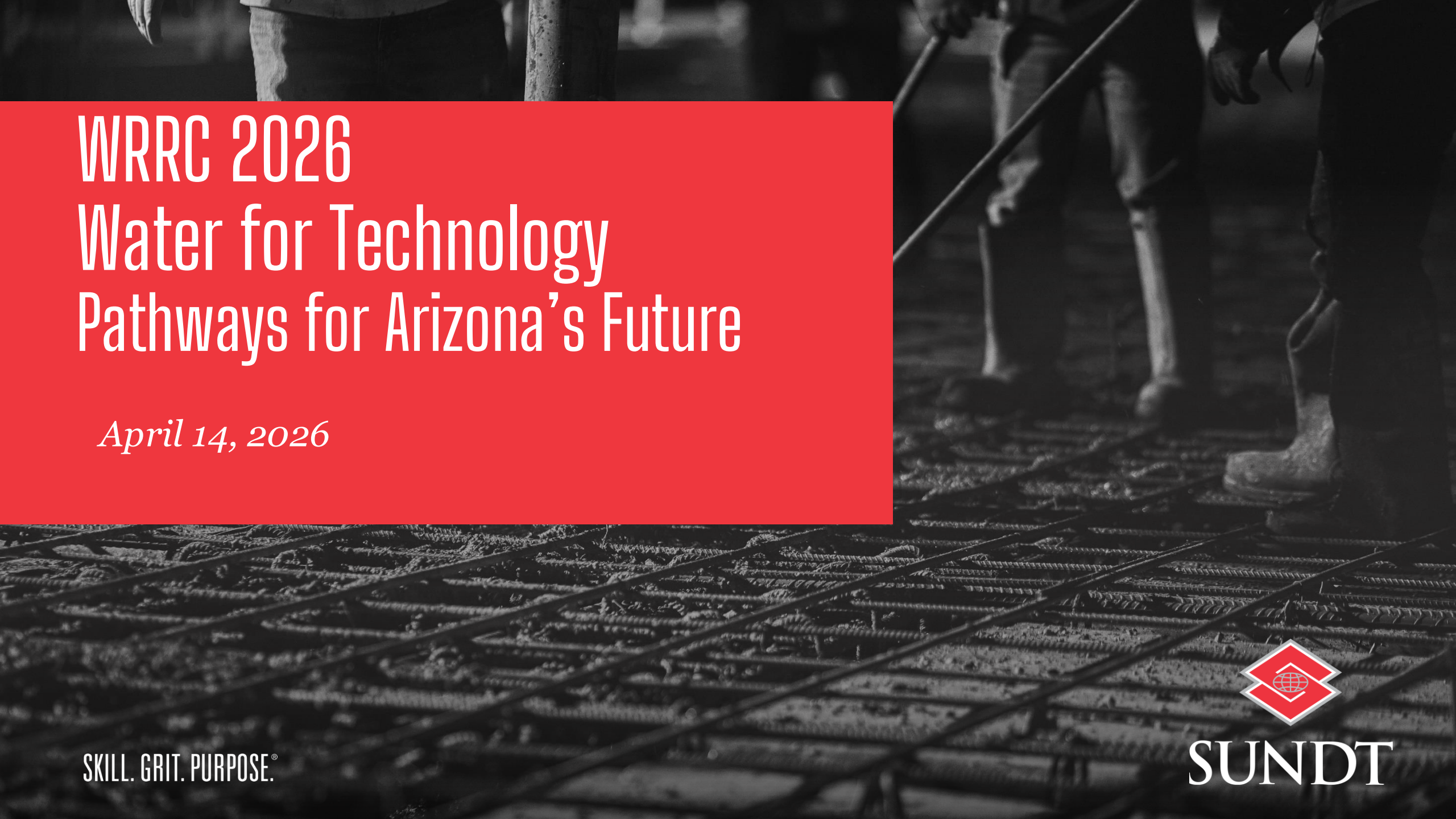


WRRC 2026
Water for Technology
Pathways for Arizona's Future

April 14, 2026

SKILL. GRIT. PURPOSE.®

SUNDT

What is Happening with Water in the Tech Sector

Data Centers: *Transitioning from evaporative cooling to air cooled chillers, reducing water demand*

Semiconductor Manufacturing: *Increased demand in water with increase in technology node*

Data Center Fundamentals

IT Equipment Cooling Overview

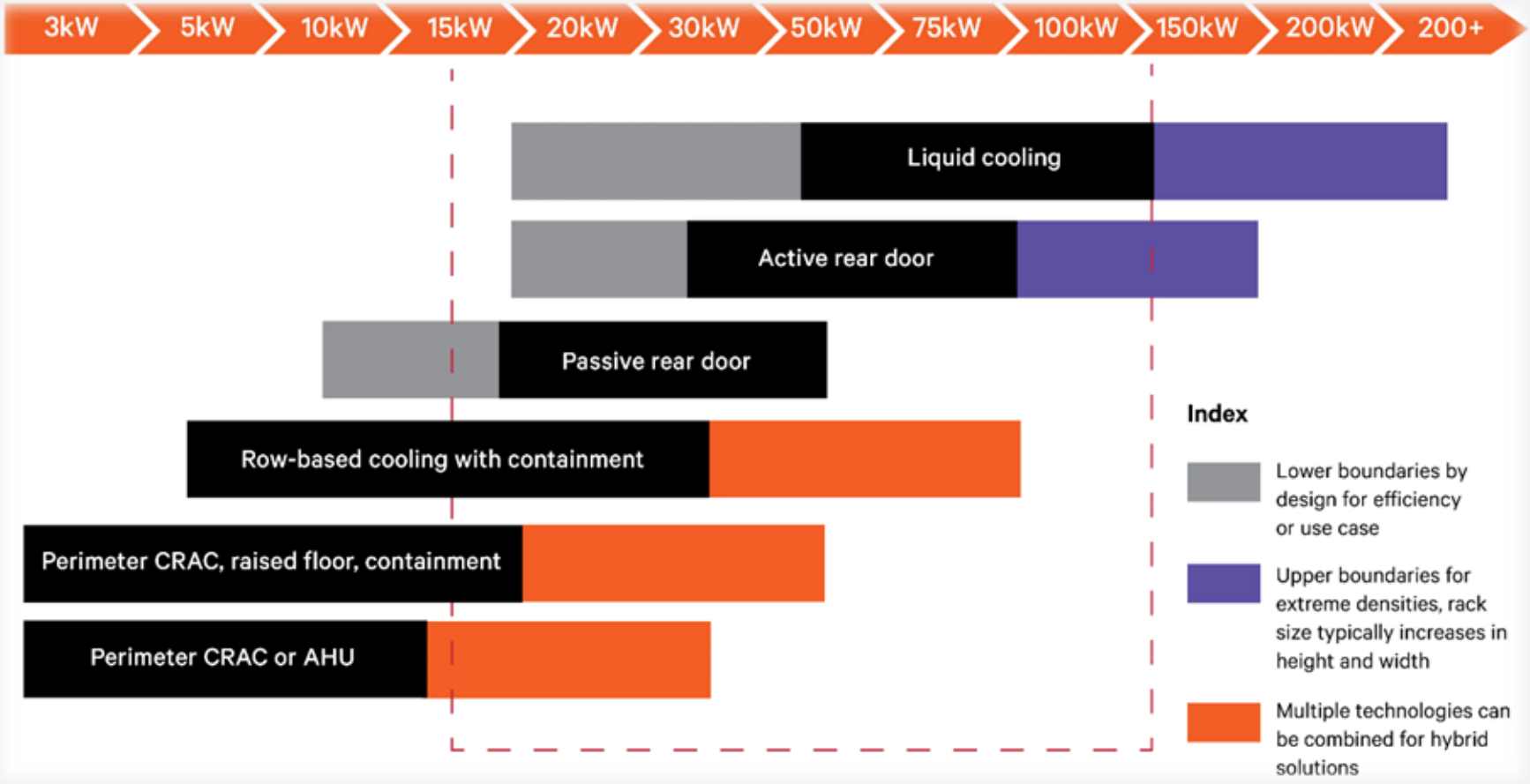


Image: VERTIV Cooling Options, based on rack It Power density

Data Center Fundamentals

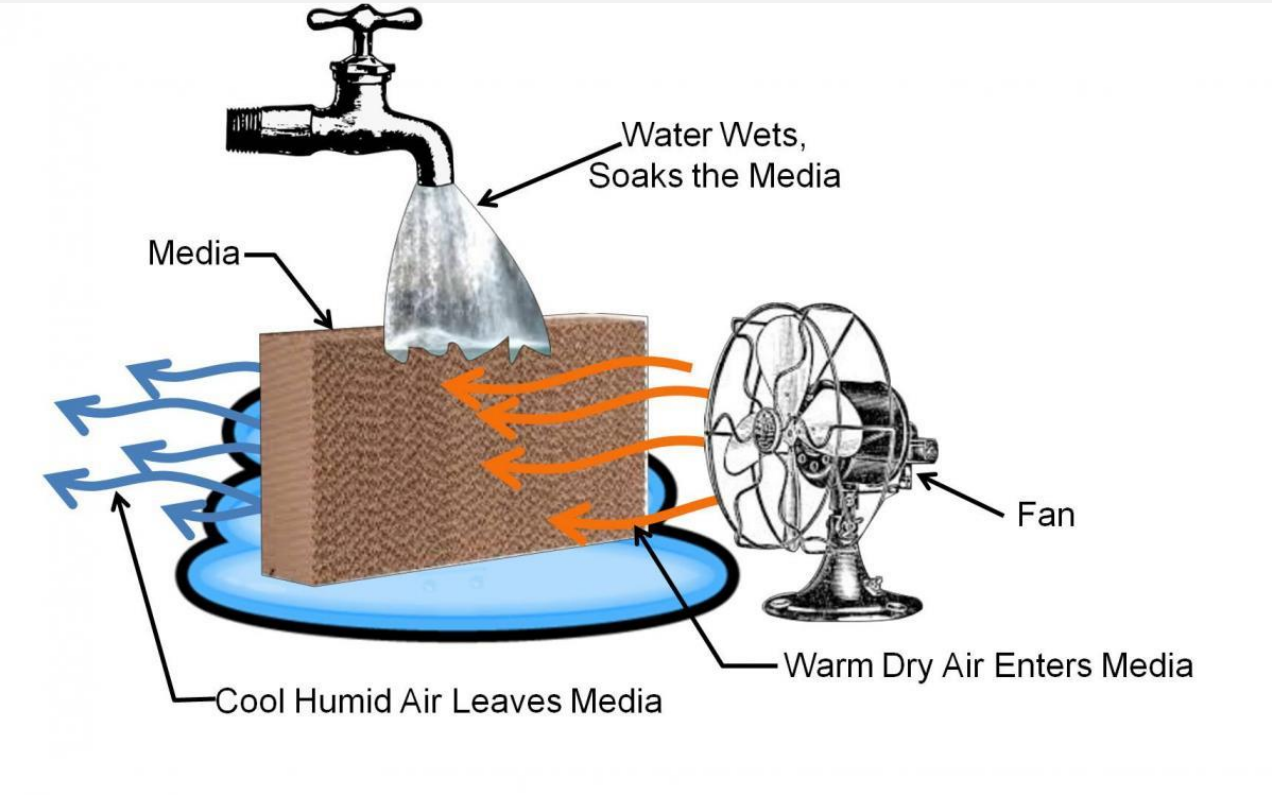
The Shift in Power Demand

Infrastructure Metric	Pre-AI Era (2014-2024)	AI Era (2025-2026)
Compute Chip Power	150W – 200W (CPU)	1,200W (B200 GPU) 6x Increase
Average Rack Density	5 kW – 8 kW	120 kW – 132 kW+ 15x Increase
Facility Total Power	10 MW – 50 MW	300 MW – 1,000 MW 20x Increase
Primary Cooling Method	Forced Air (Convective)	Direct-to-Chip Liquid

Data Center Technology cooling strategy (2014-2024)

Water Demand for Evaporative Cooling

- 1.8 L/kWh (industry average)
- Large 50 MW Data Center utilizing 90K L/Hr water at full load.
- 5M to 16M Liters/Day*



Facilities based AI demand for direct to chip cooling(2024 - 2026)

Water Demand for New AI Facilities

- Zero water consumed on daily basis
- Only use water to fill and flush closed loop piping systems

Semiconductor Manufacturing

Water Quality Overtime

Parameter	Late 2000s (~32nm-45nm)	Current/Advanced Nodes (<10nm)
Resistivity	Close to 18.2 MΩ·cm	**>18.2 MΩ·cm** (theoretical limit)
TOC (Total Organic Carbon)	< 2–5 ppb	**< 1 ppb** (often <0.5 ppb)
Particle Size	~20–30 nm	**Down to 2 nm**
Boron / Silica	< 1 ppb	**< 0.1–0.3 ppb**
Metals	Parts per billion (ppb)	**Parts per trillion (ppt)**

- Increase in water quality demands more water to be used to make the water

Semiconductor Manufacturing

Primary Water Usage in the Facility

More chips, more water

Rising capex is expanding semiconductor manufacturing, driving up water demand

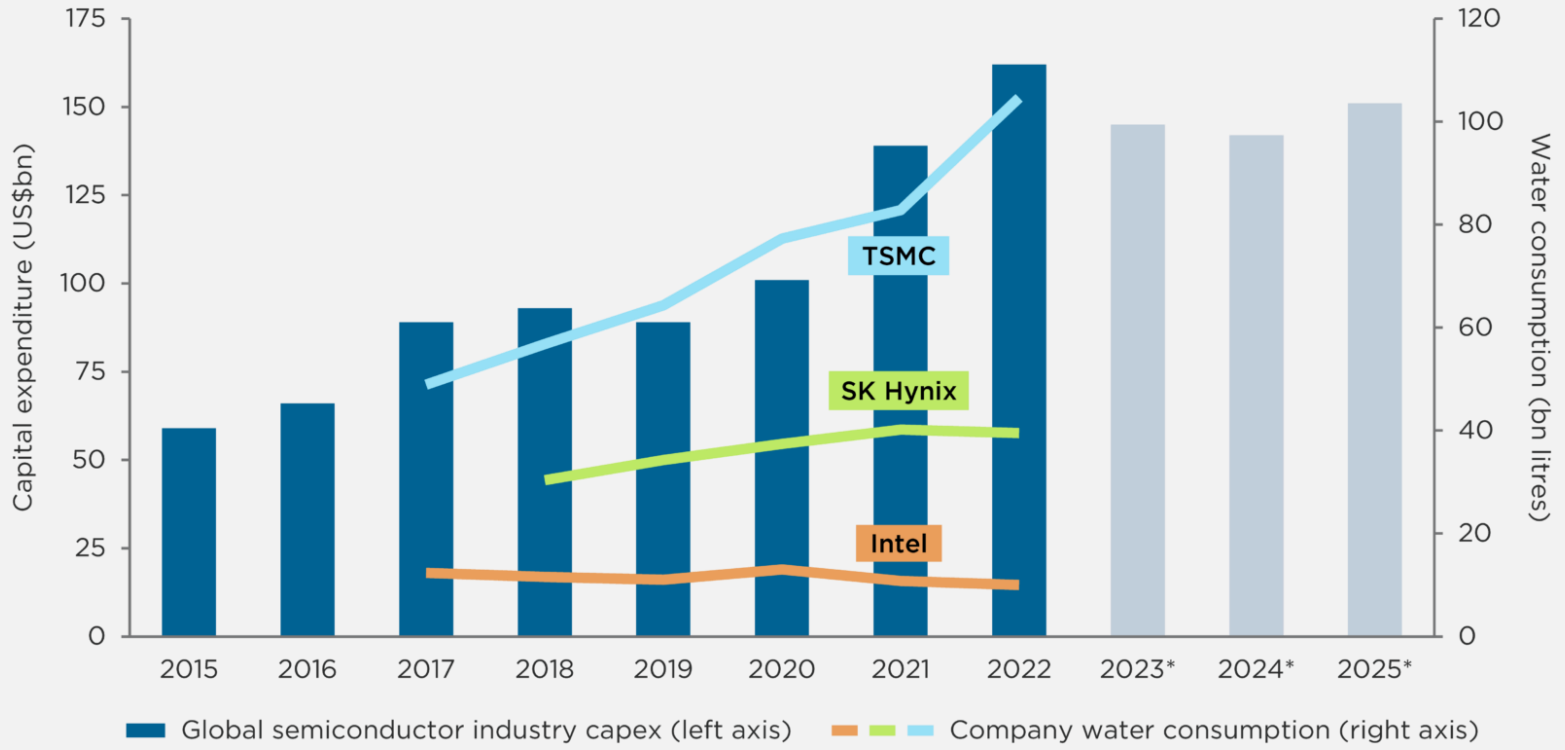
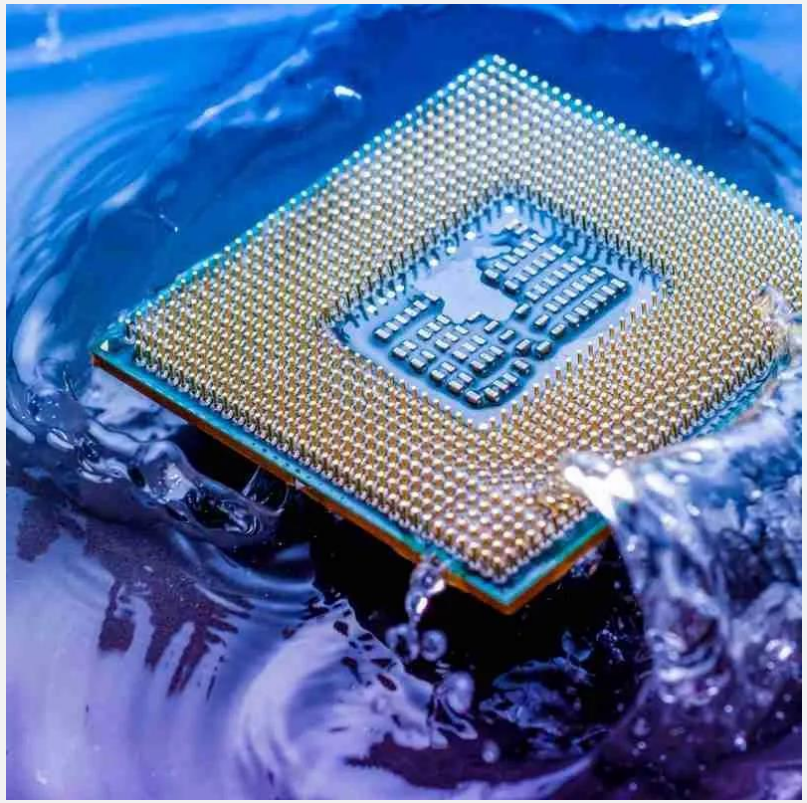
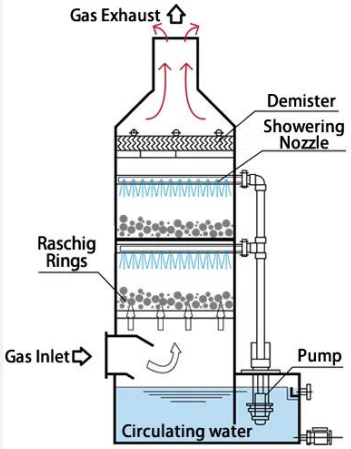


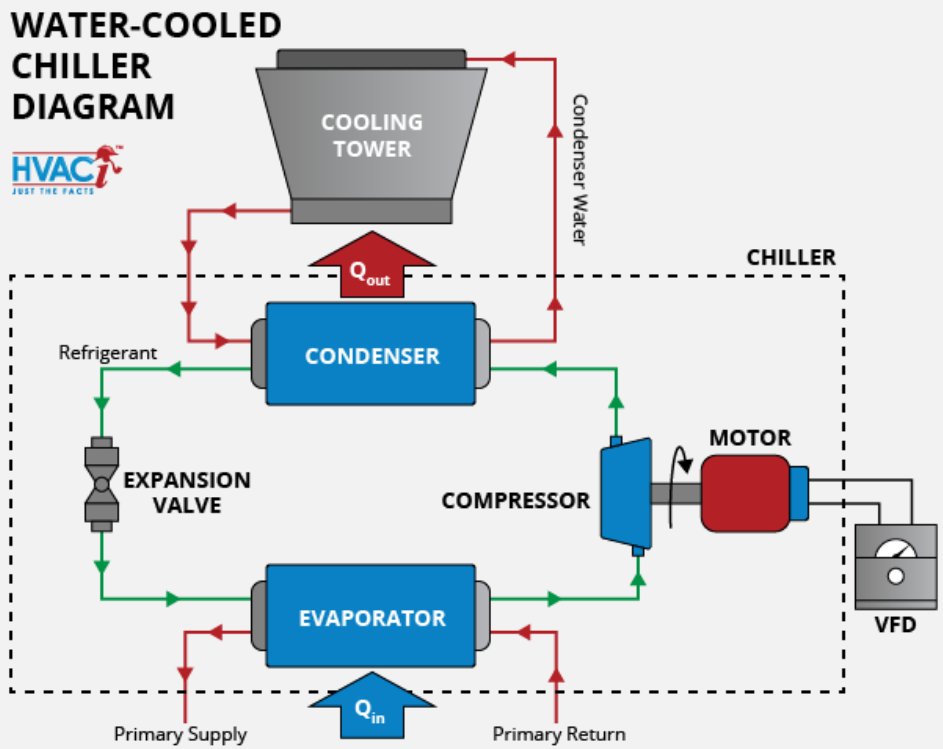
Image from IMPAX: Example of water usage trends

Semiconductor Manufacturing

Primary Water Usage in the Facility

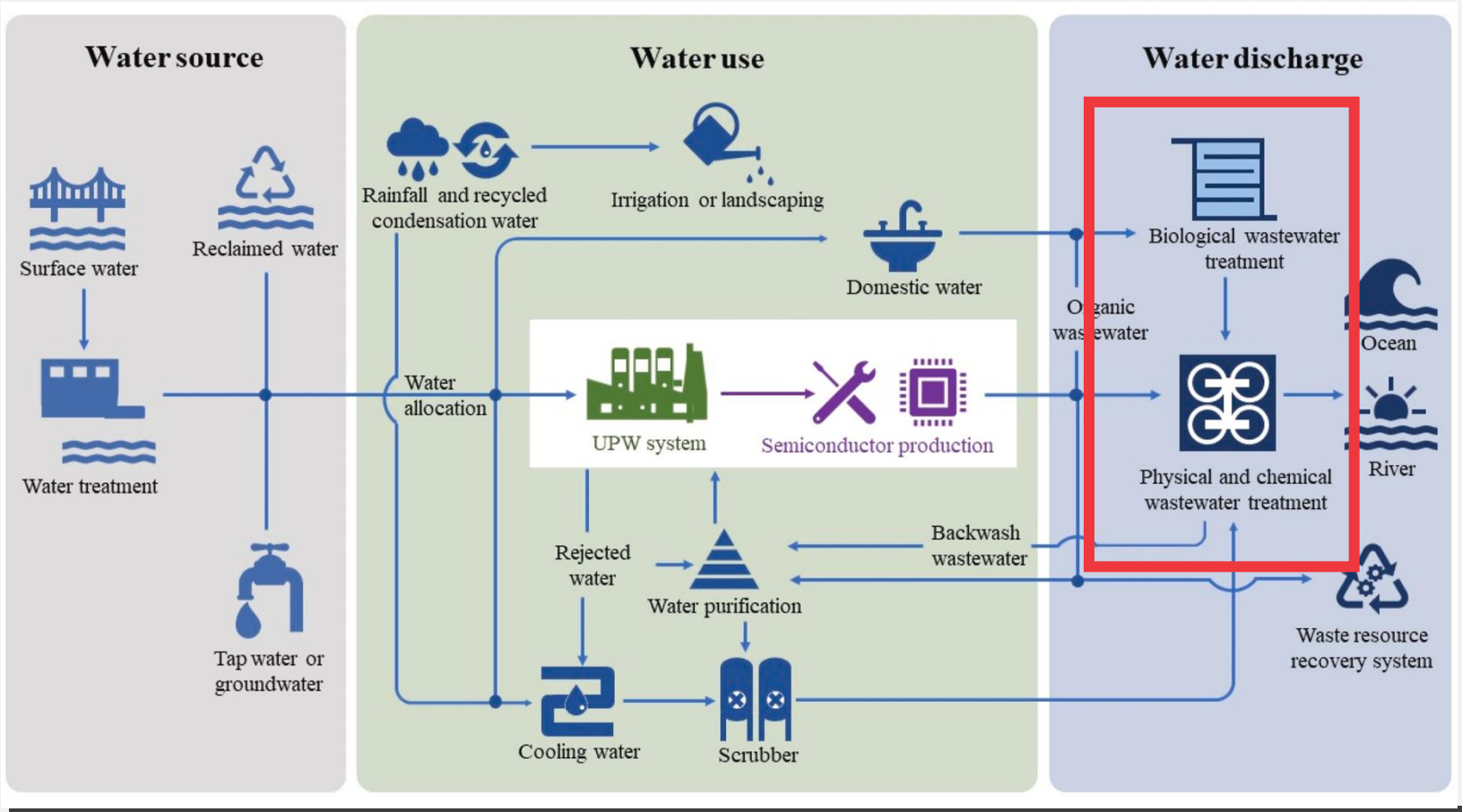






Semiconductor Manufacturing

Water Reclaim and Recycle



All major semiconductor companies have large zero liquid discharge facilities as part of their sustainability goals

Common Themes

How the semiconductor and data center worlds collide

Greater demand in data center capacity will drive to increased semiconductor production of the latest technologies