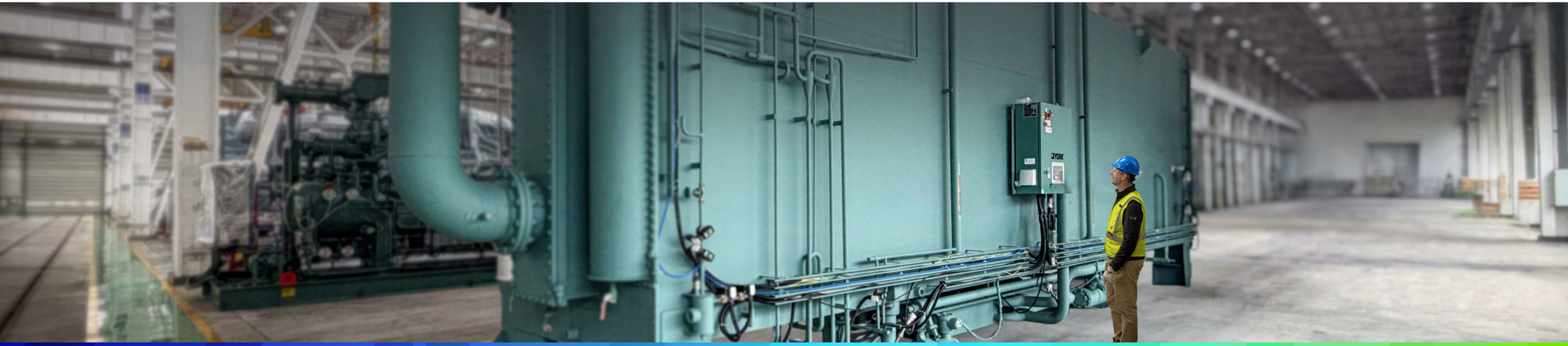


Water cooled | Air cooled | Gas cooler | **Heat reuse** | Heat recovery

# 1 Gigawatt AI Factory Blueprint

Thermally driven absorption chillers with on-site power generation (407)

# Overview

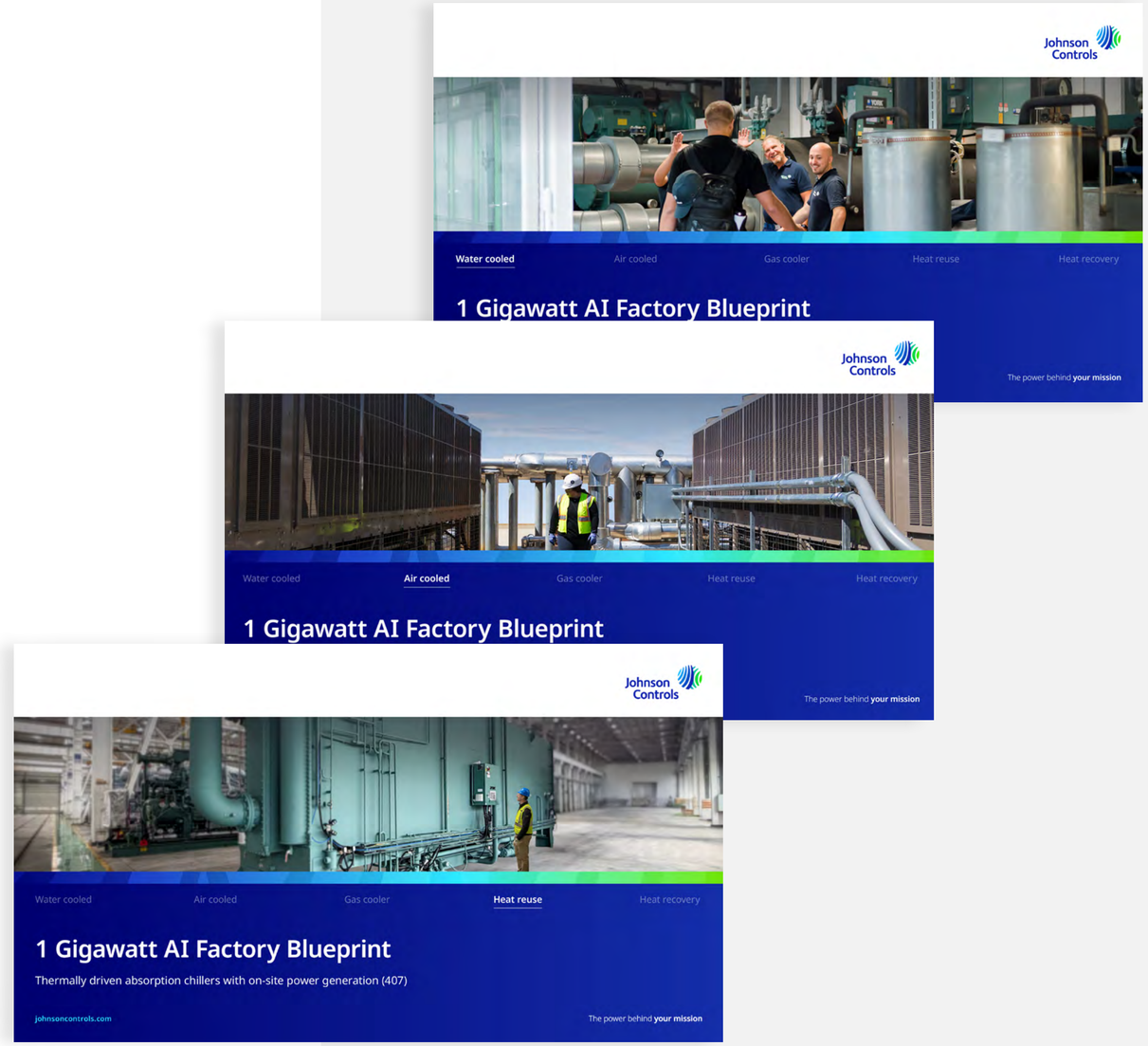
## Reference design guide program

Providing strategic support and accelerated time to design, Johnson Controls is privileged to publish a series of **global reference design guides**. Focused on the emerging class of AI Factories, these guides outline how to build high-performance, scalable facilities through a rigorous thermal management lens.

Our experts map the full thermal chain by defining the various paths from the chip to the atmosphere and examining the multiple solutions available to data center designers and operators. As no single approach fits every geography or workload, the series provides alternative cooling architectures that enable industry-leading Power Usage Effectiveness (PUE) and Water Usage Effectiveness (WUE). Our solutions also maintain the flexibility to scale across diverse climates, ambient temperatures and various elevations.

*Developed in collaboration with **Lynk Engineers** – a multidisciplinary firm with 40+ years of experience delivering integrated energy, cooling and critical infrastructure solutions for mission-critical facilities.*

> *"One of the biggest untapped opportunities in data centers is the heat they generate. Johnson Controls helps transform recovered heat into useful power through CHP and absorption cooling solutions, enabling AI Factories to scale more efficiently while reducing strain on the grid and delivering value to local communities."*
>
> **Austin Domenici,**
> President, Global Data Center Solutions, Johnson Controls



# Overview

## Thermally driven absorption chillers with on-site power generation for a 1 gigawatt AI Factory

Reference Design Guide 407 outlines how to plan and design a 1 gigawatt (1GW) AI Factory built around thermally driven absorption chillers paired with on-site power generation. The architecture integrates Combined Heat and Power (CHP) generators, hot-water driven absorption chillers and direct gas-fired absorption chillers for cooling – instead of electrically powered chillers. The benefits include capturing waste heat from on-site generation and reusing it to deliver cooling with minimal electric consumption. The guide provides sizing references for 110MW compute clusters and includes recommended design temperatures and operating conditions across each stage of the thermal chain – from chip to ambient.

With this approach, the design delivers the following critical outcomes:*

- **~44% reduction in cooling electrical load – freed power supports either:**
  - **More compute:** Up to +97MW of additional IT capacity
  - **Lower peak emissions:** 43% reduction in chiller plant $CO_2$ emissions (avoids 46.3 metric tons/hour)
- **Lower PUE with zero water tradeoff:** PUE of 1.23 and WUE of 0 through absorption cooling with dry coolers
- **Grid-independent, resilient operation:** on-site generation with redundancy ensures continuous cooling
- **Modular, scalable deployment:** 1:1 pairings of generators to chillers enable scaling without redesign

* vs. generator-powered electric chillers

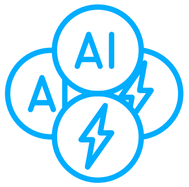

Follow the link below to engage with an expert, download a copy of this guide or learn how we can help you unlock more AI capacity.

**Find out more or talk to an expert**

**Click here**

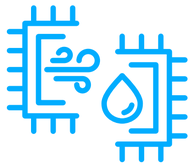
 

# Gigawatt AI Factory
## Intended goals



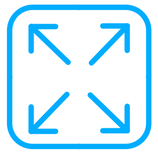

**Maximize tokens per therms**

by converting every unit of fuel into productive IT compute through the reuse of waste heat for cooling



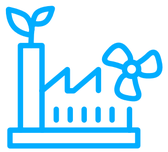
**Prepare for next-generation innovation**

through a flexible thermal architecture that adapts to evolving GPUs, temperatures and power sources



**Enable rapid scaling to reduce time to revenue**

with a modular, repeatable design that supports phased deployment from 100MW to 1GW scale



**Maintain the promise of sustainability**

by leveraging cooling technologies that use zero water, use zero-GWP refrigerants and reduce $CO_2$ emissions

## Addressable industry challenges

**27%**

**Chiller plant power**
As a percentage of IT load

**57%**

**Power generation loss**
Energy lost as heat with on-site power generation

**CUE**

**Carbon Usage Effectiveness**
Emerging metric measuring $CO_2$ emissions per unit of IT energy consumed

**12.2 million**

**Gallons per day**
Water dependency to cool 1GW with evaporative cooling

# Gigawatt AI Factory
## Overview

### AI Factories are production facilities

Transforming raw data into actionable insights, AI Factories are where intelligence is forged – not just stored. These modern production facilities transcend traditional data centers by shaping the future of industries and turning infinite data into breakthroughs that redefine what's possible.

### Consistency and scalability are fundamental

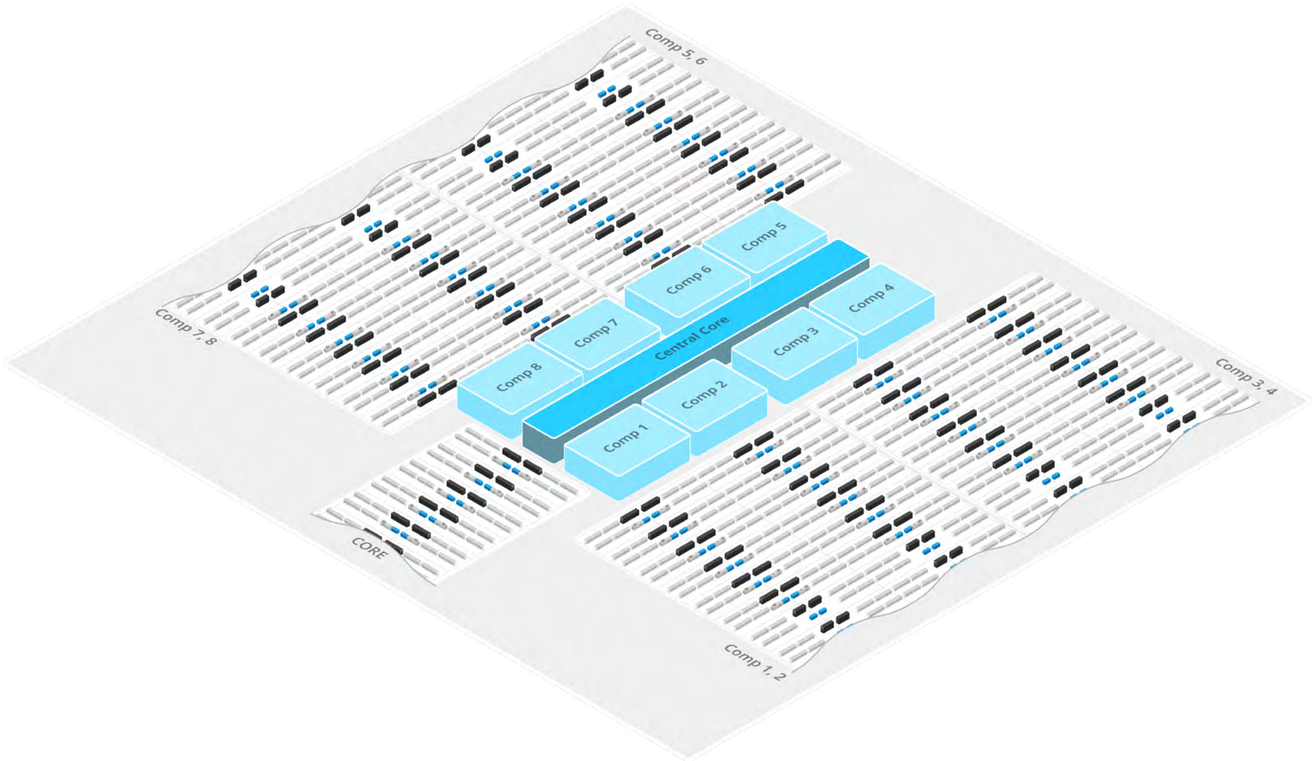
In the era of AI Factories, the foundation for growth drives the capability to manufacture intelligence at an industrial scale. Infrastructure design must be repeatable and globally scalable to reduce on-site labor and accelerate deployment.

### Built to evolve

Like traditional production facilities, AI Factories must be built for evolution – because tomorrow's GPUs will redefine scale and performance. AI Factories must be designed as adaptable facilities with flexible cooling architecture to seamlessly integrate next-generation computing that keeps intelligence flowing without limits.

### Sustainability and efficiency

Building intelligence at gigawatt scale demands sustainability – conserving land, power and water while maximizing efficiency. By creating facilities that minimize impact and act as good neighbors, we enable progress that respects both communities and the planet.



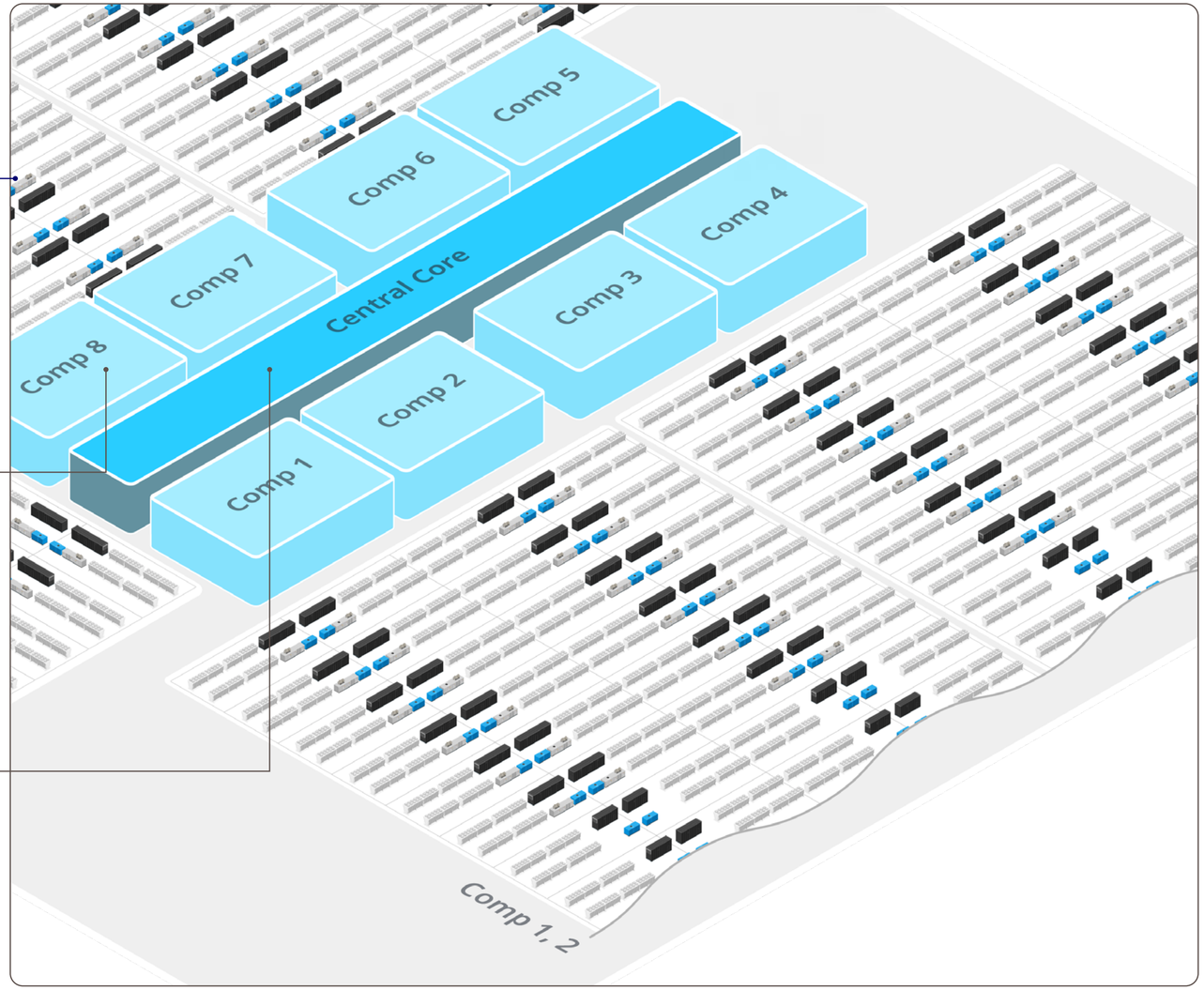

 

# Gigawatt AI Factory
## Blueprint breakdown

### Gigawatt AI Factory
- 8 compute clusters (110MW each)
- 1 central core for networking (120MW)

### Each compute cluster (x8)
- Contains 110MW of compute capacity
- 90% liquid cooled, 10% air cooled

### Central core
- Single networking core capable of 120MW of compute
- Flexible liquid-to-air ratio



# Gigawatt AI Factory
## Compute cluster breakdown

### Each compute cluster (x8)

- Contains 110MW of compute capacity
- 90% liquid cooled, 10% air cooled

### Modular distributed cooling infrastructure

**Liquid-cooled chip**

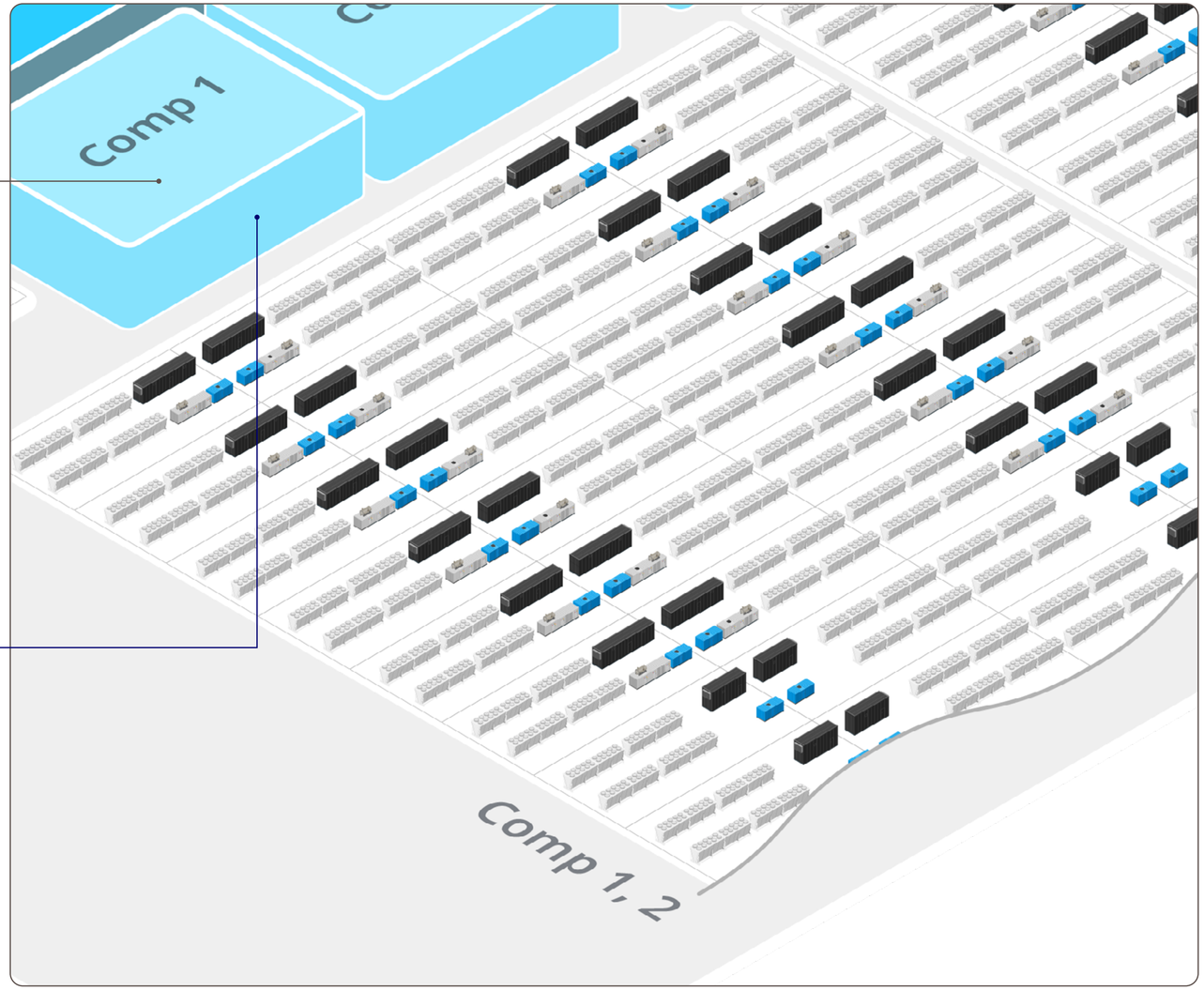
TCS loop supply:
30°C | 86°F

**Air-cooled equipment**

CRAH air supply:
27°C | 80.6°F

**Combined facility loop**

18.3°C | 65°F supply
25°C | 77°F return



# Summary of AI Factory
## Selected equipment list

### AI Factory blueprint

Designed for multiple generations of IT equipment hardware:

- 1GW campus
- Build 1 x 120MW central core
- Build 8 x 110MW compute sectors
- Max ambient operating temperature 55˚C/131˚F* (design temperature 40˚C/104˚F)

### Equipment list per compute cluster**

Generators:

- 72 reciprocating gas engines
  – Combined Heat and Power (CHP units)

Thermally driven absorption chillers:

- 72 Hot-water driven absorption chillers
- 12 Direct gas-fired absorption chillers

Gallery equipment:

- 264 Coolant Distribution Units (CDUs)
- 196 Computer Room Air Handlers (CRAHs)

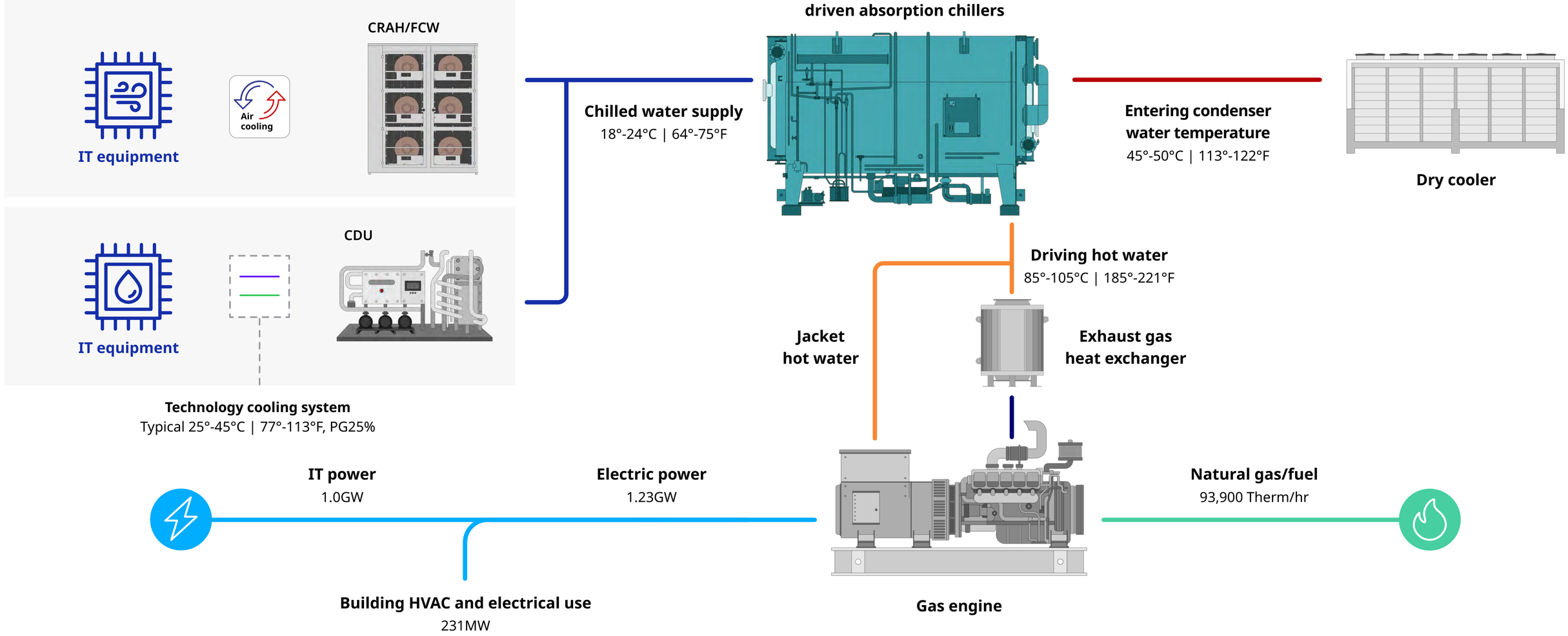

* At 55°C ambient, chilled water supply temperatures rise above the design values

** Total counts include redundant units

# Gigawatt AI Factory

## Absorption chillers with on-site power generation

**On-site generators and hot-water driven absorption chillers convert recovered waste heat into chilled water, eliminating the electric chiller load. The diagram below reflects a 1GW campus, with liquid loop temperatures shown as typical application ranges.**



# Combined Heat and Power, engineered as one system

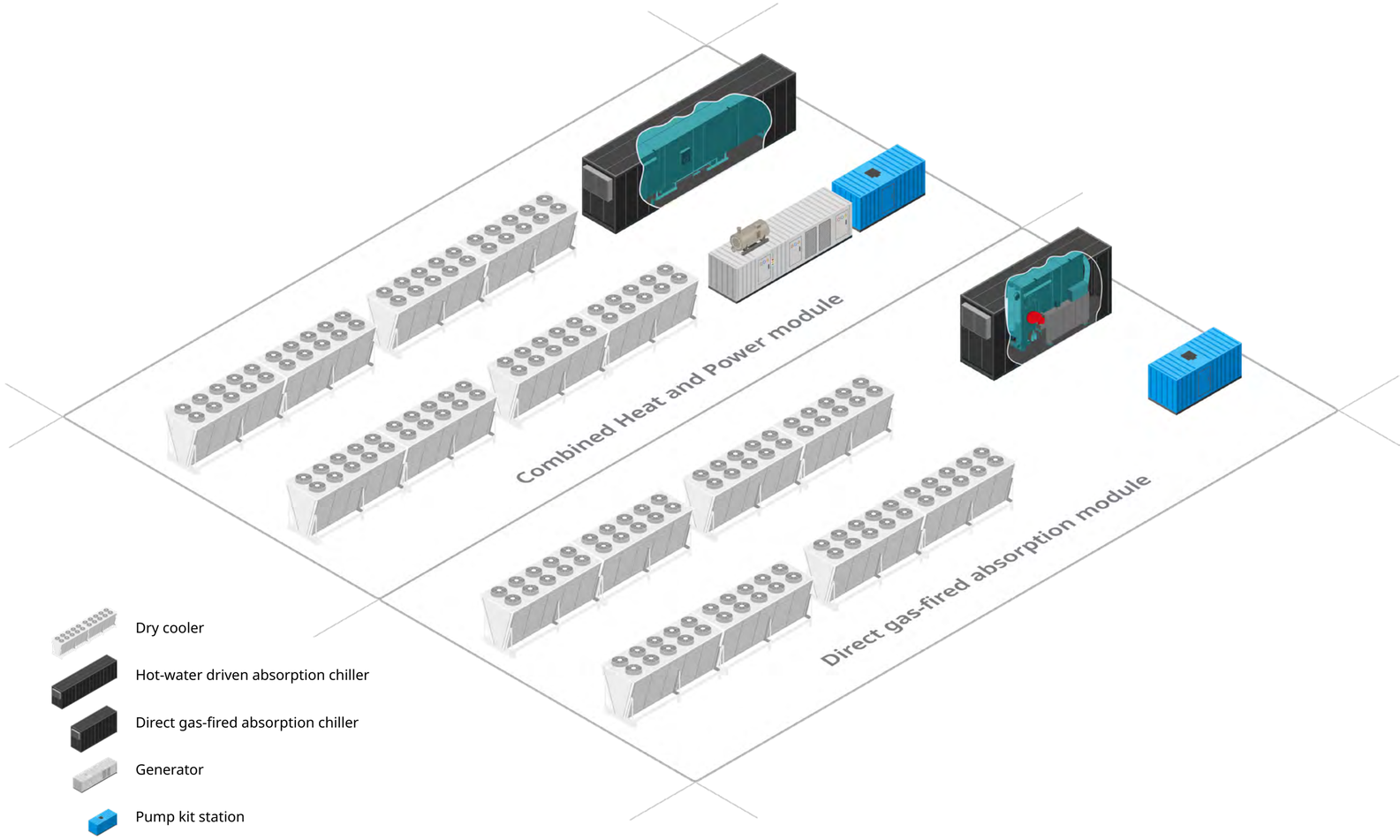
## One fuel input delivers both electricity and cooling at scale

**Pairing each generator with an absorption chiller turns one fuel input into two outputs – electricity and cooling – delivered through a single modular system.**

- **1:1 generator-to-absorption pairing:** every unit of waste heat is captured and reused so nothing is lost
- **Engineered as one integrated module:** pumps, heat exchangers, absorption chillers and dry coolers work together to deliver coordinated performance
- **Dual output from one fuel input:** electricity powers IT compute while recovered heat drives cooling
- **Modular by design:** scalable deployment simplifies supply chain logistics and accelerates time to token
- **Built for nonstop operation:** grid independent, resilient design with redundancy built in

### Unit staging – ready for peak

Hot-water driven absorption chillers for efficiency; direct gas-fired absorption chillers for ramp up and redundancy



# Two ways to win with on-site power and heat reuse

## One integrated system delivers either lower fuel consumption or more IT compute

**On-site power generation, paired with CHP and absorption cooling, captures and reuses waste heat to deliver advantages over a conventional electric chiller baseline.**

1

**Lower fuel consumption**

Same IT load, less fuel

**8,746** therms/hr peak savings ↓

vs. electric chiller baseline at same IT load

**OR**

2

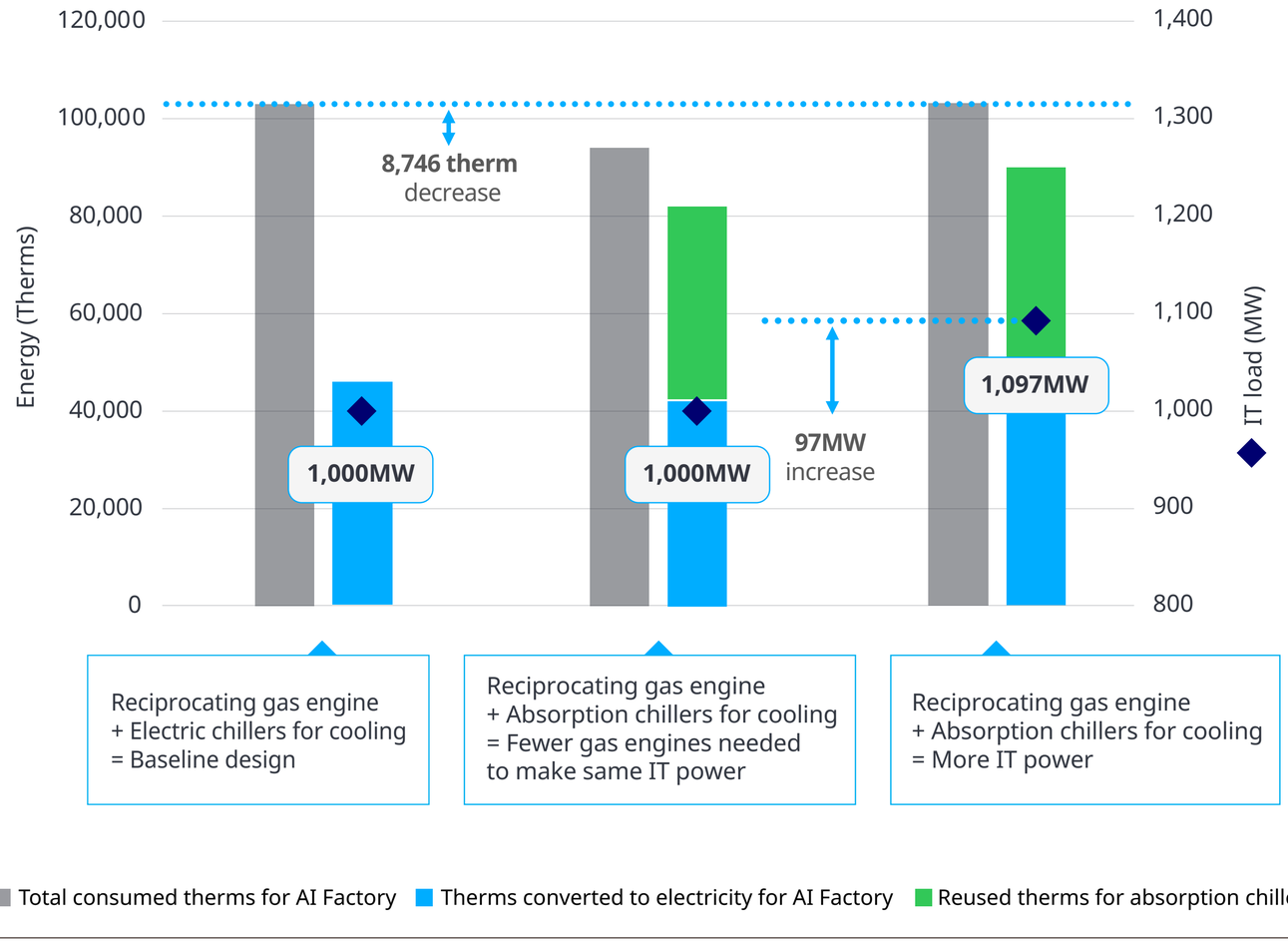
**More IT compute**

Same fuel input, more IT power

**97MW** additional IT load ↑

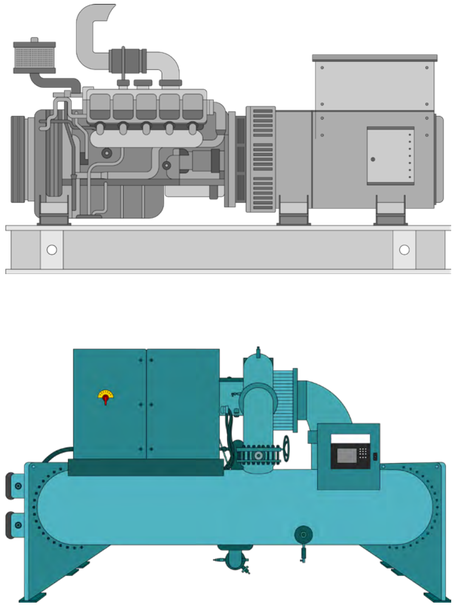
vs. electric chiller baseline at same generator capacity

### On-site power and heat recovery performance comparison



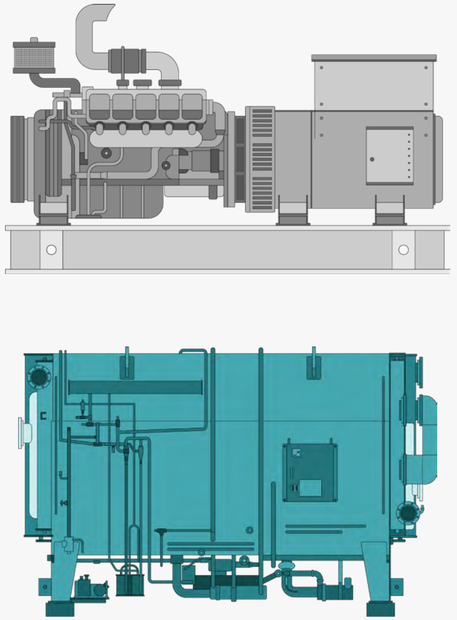
# Output maximized from every unit of energy

## Cooling powered by waste heat – instead of electricity – frees IT compute capacity



**Generator with electric chiller**

**27%** Chiller plant power as a percentage of IT load



**Generator with absorption chiller**

**15%** Chiller plant power as a percentage of IT load

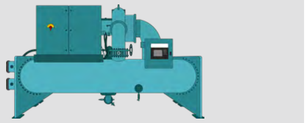
→ **97MW** returned to factory

Metrics referenced here reflect peak demand

# Achieve both energy and water efficiency

## Absorption chillers and dry coolers break the conventional PUE vs. WUE tradeoff

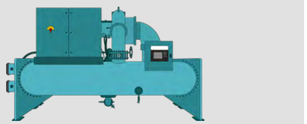
**Data centers typically need to choose between Power Usage Effectiveness (PUE) and Water Usage Effectiveness (WUE). Conventional designs improve one at the expense of the other. The integrated Combined Heat and Power (CHP) + absorption chiller + dry cooler system breaks the tradeoff and delivers improvement in both metrics simultaneously.**

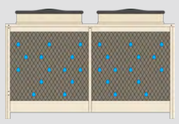


Electric chiller baseline

**PUE** = 1.35 | **WUE** = 0

Higher energy use, zero on-site water use

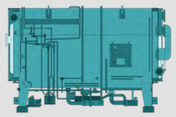




Electric chiller + adiabatic cooler

**PUE** = 1.27 | **WUE** = 3.4

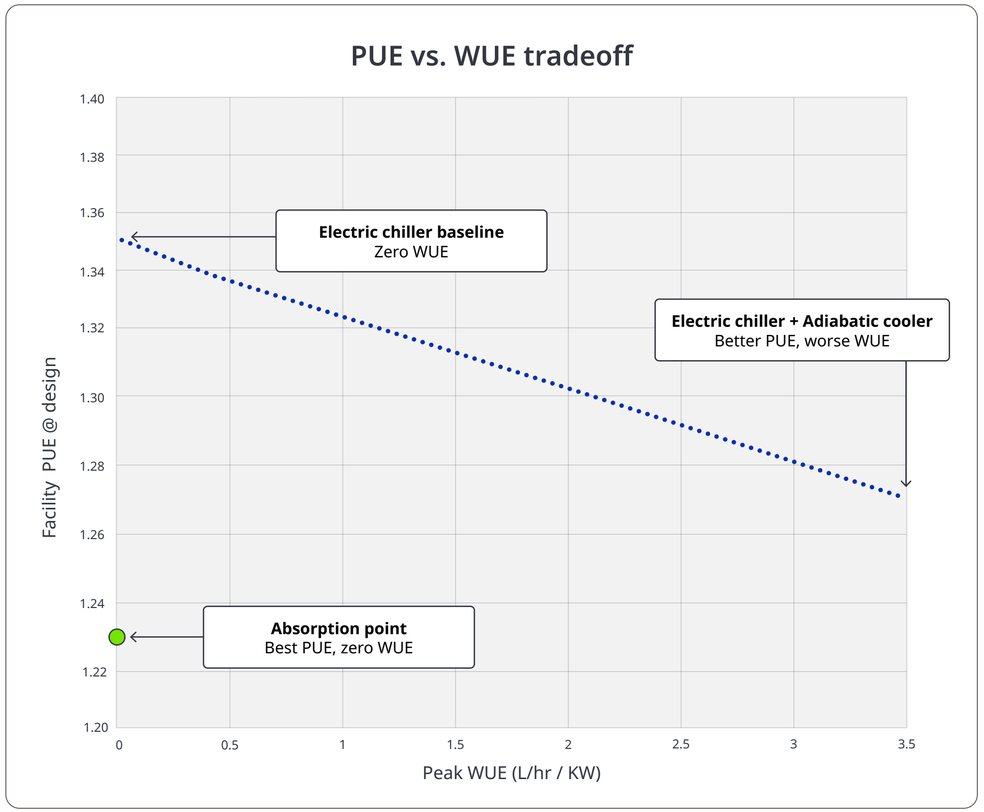
Slightly better PUE, but uses more water



Absorption chiller + dry cooler

**PUE** = 1.23 | **WUE** = 0

Best PUE AND zero on-site water use – no tradeoff




Data based on Southwest US location

### Key insight

Absorption chillers with dry coolers deliver the lowest PUE and zero WUE in a CHP system.*

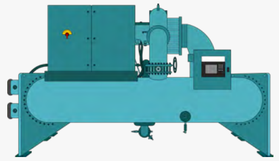
**Absorption**

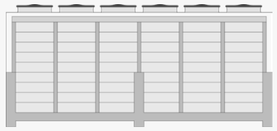
**Best choice for on-site generation**

* Based on these three options

# Better PUE, zero WUE – no tradeoff required

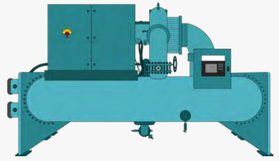
## Absorption chillers with dry coolers deliver the best of both efficiency metrics

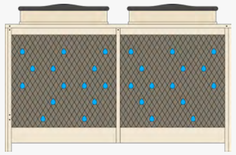




**Electric chiller with dry cooler**

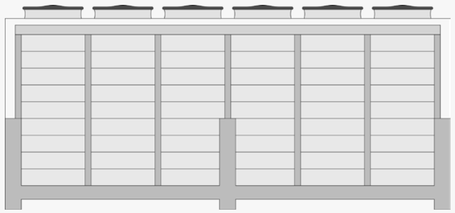
**1.35** PUE **0** WUE

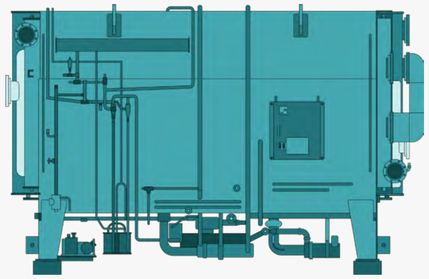




**Electric chiller with adiabatic cooler**

**1.27** PUE **3.4** WUE





**Absorption chiller with dry cooler**

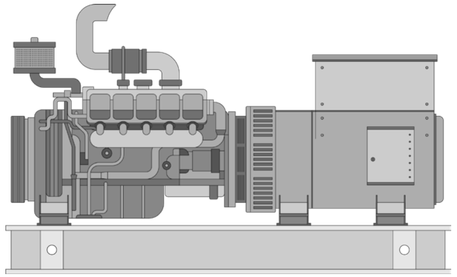
**1.23** PUE **0** WUE

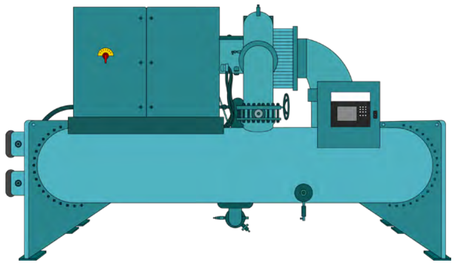
**PUE** = Power Usage Effectiveness **WUE** = Water Usage Effectiveness
Metrics referenced here reflect peak demand

# Better carbon footprint with integrated design

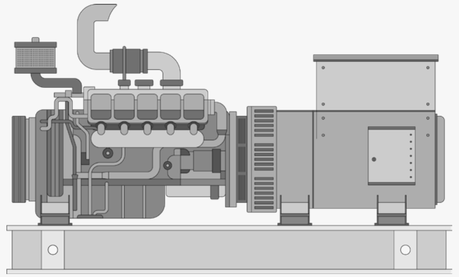
## CHP generator with absorption cooling delivers measurable $CO_2$ savings

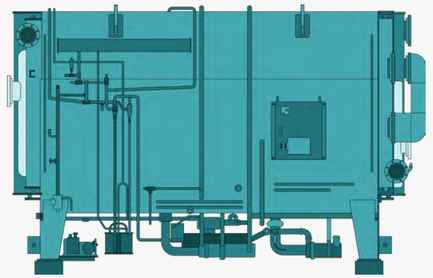
**The choice of power and cooling architecture has a direct impact on emissions. Moving from grid-connected to on-site power, and then to integrated CHP with absorption cooling, progressively reduces $CO_2$ output while supporting the performance and reliability standards of mission-critical facilities.**





**Generator with electric chiller**





**CHP generator with absorption chiller**

*"A vast amount of heat produced by on-site power generators is essentially thrown away – dissipated into the air. We see a huge opportunity when that energy is put to work instead. By converting waste heat into useful cooling, we're turning a resource already bought and paid for into an asset rather than a disposal liability. Every megawatt we can shift from cooling to computing capacity helps customers increase the revenue potential of their facilities and accelerates time to value by significantly cutting pressure on the grid. That's the kind of innovation that supports AI growth, lowers costs and helps communities and businesses get more from existing energy resources."*

**Katie McGinty,**
Vice President and Chief Sustainability and External Relations Officer, Johnson Controls

**0.108** $_pCUE$

**0.061** $_pCUE$ **46.3**

**Metric tons / hour of $CO_2$ peak emissions avoided**
***43% reduction***

**$_pCUE$** = partial Carbon Usage Effectiveness; peak $CO_2$ emissions from on-site power generation for the chilled water plant

# Higher compute efficiency through heat reuse

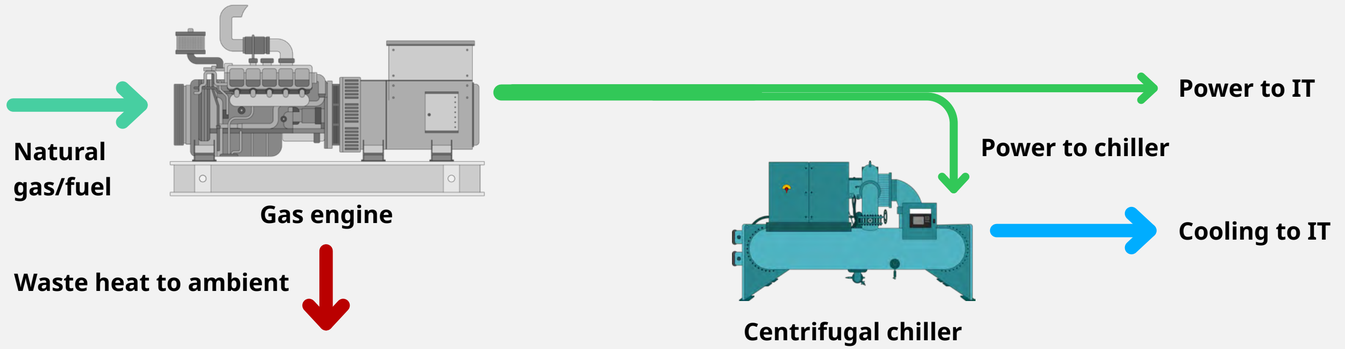
## Same fuel input. More IT compute. Less waste.

### The operating model shift

**By reusing thermal energy that would otherwise be lost, the same fuel input can deliver more usable IT compute through efficient heat reuse that leverages absorption cooling.**

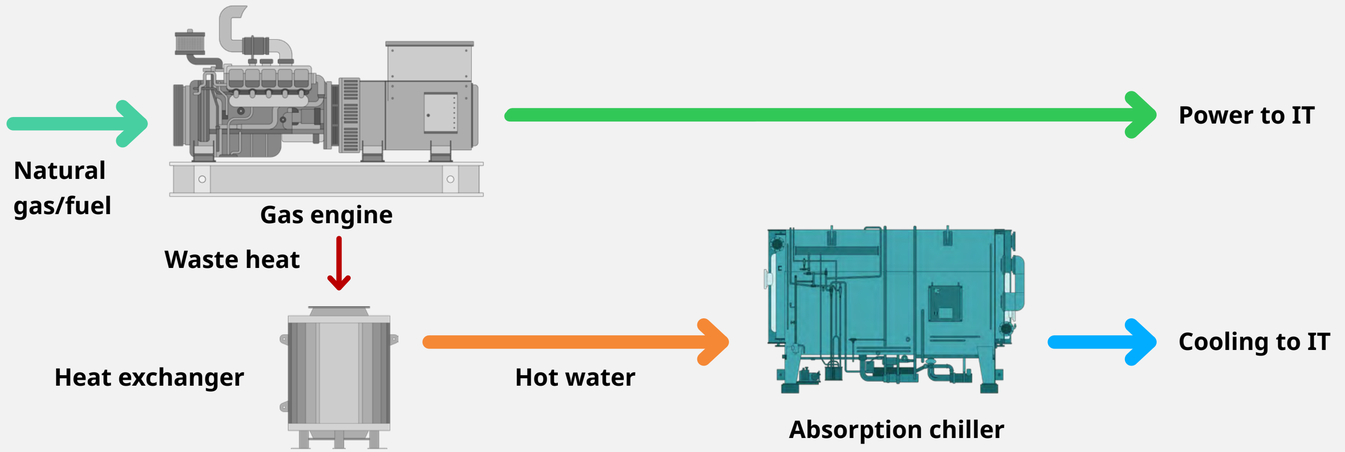
- **More compute from the same fuel input:** **~57%** energy is lost as waste heat with on-site power generation. Absorption chillers reuse 80% of this waste heat to produce chilled water for the AI Factory
- **Waste heat becomes a productive resource:** recovered thermal energy powers cooling, freeing electricity for IT compute
- **Cooling with minimal electrical input:** thermal energy produces chilled water
- **A fundamentally different operating model:** heat drives cooling, shifting from electric-intensive to thermally driven

### Electric chiller baseline




**Same fuel input, two very different outcomes**

### CHP + absorption chiller

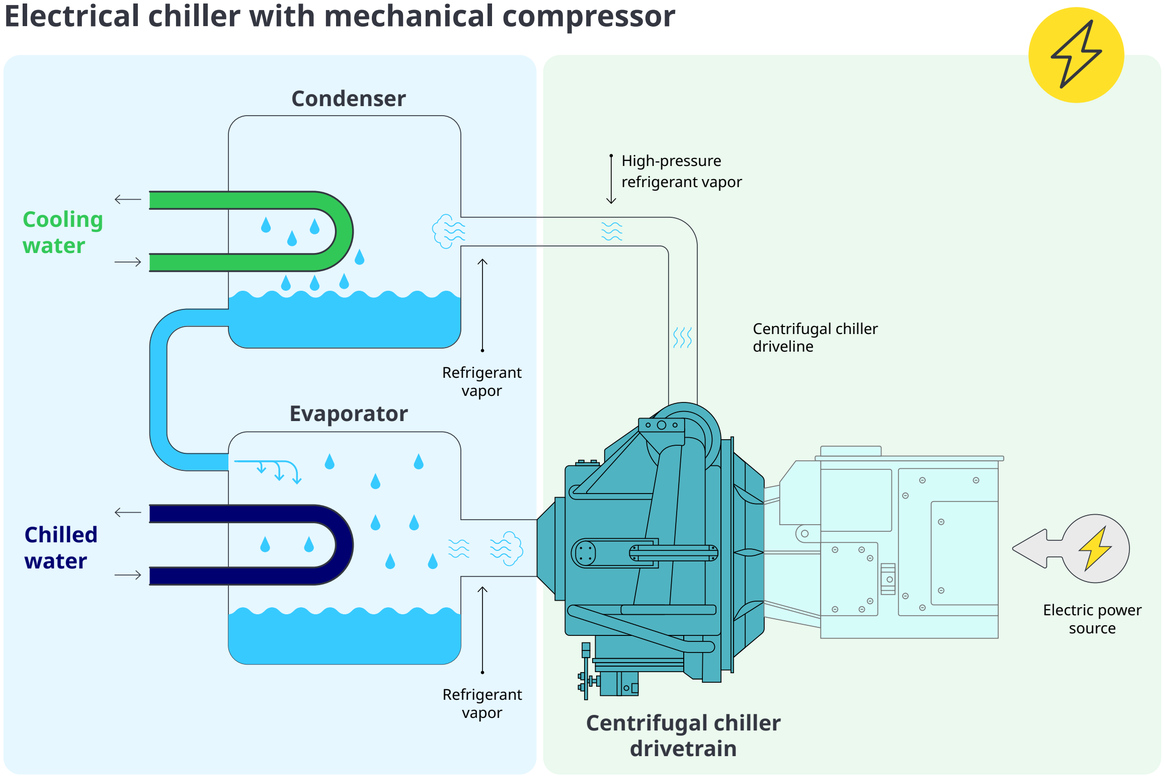


# Absorption cooling at work

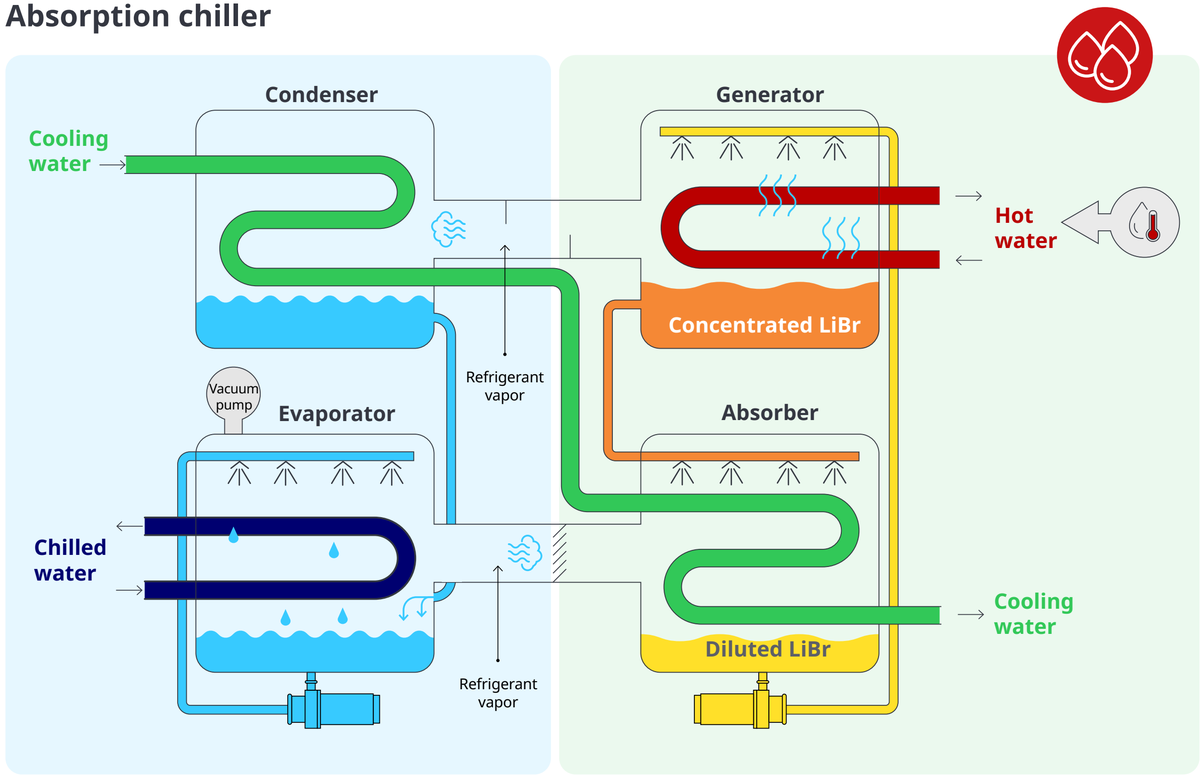
## Reuse heat to generate chilled water without electric compression

**Absorption cooling transforms waste heat into chilled water using water as the refrigerant and a lithium bromide solution to drive the cycle. Powered by recovered heat instead of a mechanical compressor, it delivers cooling with minimal electrical input (~0.04kW per ton). This improves overall fuel efficiency and frees electrical capacity for IT compute.**

### Electrical chiller with mechanical compressor




### Absorption chiller



# Factory-built, integrated, ready to scale

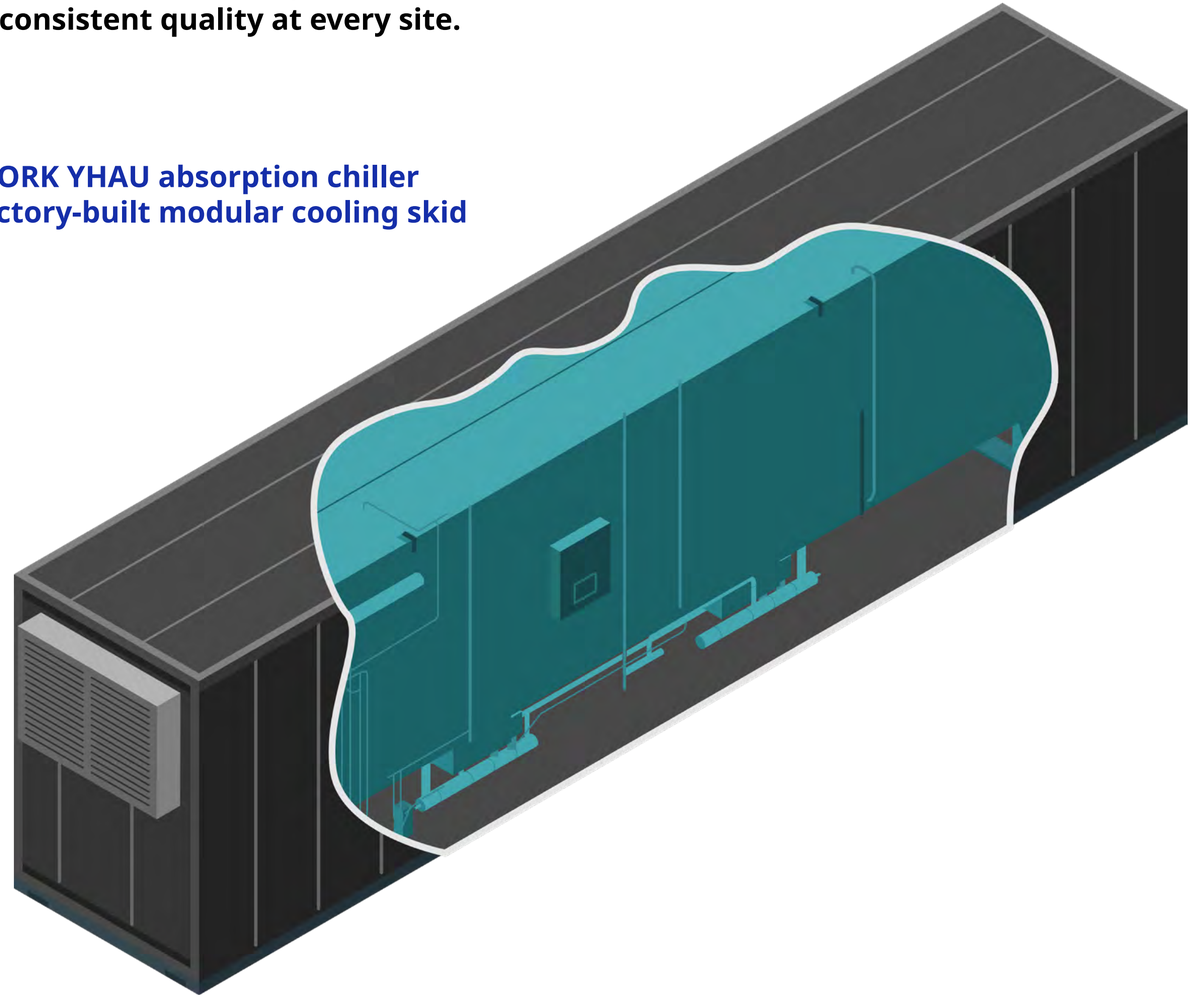
## Modular cooling skids deliver faster, with less risk

**By packaging chillers, piping, controls and electrical into a single factory-built modular cooling skid, Johnson Controls accelerates deployment, reduces execution and delivers consistent quality at every site.**

### Factory-built models from Johnson Controls deliver value:

- **Faster deployment:** Factory builds run parallel to site work, which accelerates time to market
- **Dedicated manufacturing scale:** Our dedicated space and technical resources ensure quality-controlled environments, built to ISO standards
- **Integrated, pre-tested plug-and-play modules:** Chillers, pumps, piping, controls and electrical delivered as a single, tested package in a compact footprint to minimize field configuration
- **Standardized and scalable:** Proven modules using standardized major components (chillers, pumps, strainers, feeders) repeat across buildings, phases and campuses
- **Single-source accountability:** We manage engineering, integration, delivery, commissioning and ongoing service

**YORK YHAU absorption chiller in factory-built modular cooling skid**



Absorption chillers are assumed to be installed in a controlled space (10˚-40˚C | 50˚-104˚F)

# The roles of direct gas-fired absorption in the design

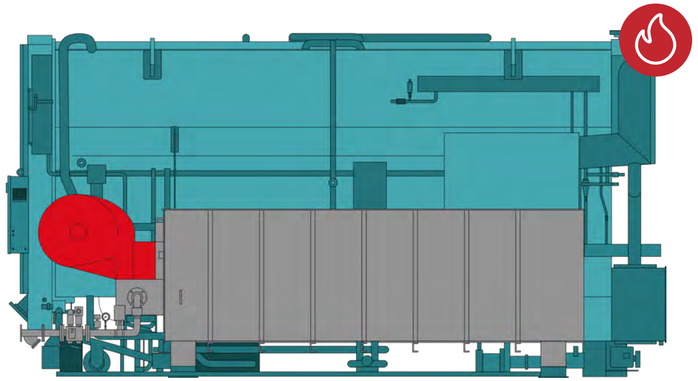
## Ensure resilience, flexibility and full coverage across all operating conditions

**Direct gas-fired absorption chillers complement the CHP-driven system by adding flexibility for startup, peak demand and operating conditions where waste heat alone is insufficient. This ensures reliable, full-capacity cooling across all conditions.**

### Three roles for direct gas-fired absorption:

- **Peak demand coverage:** On the hottest days at 100% IT load, direct gas-fired absorption chillers add extra capacity without adding generators
- **Transient and startup support:** Direct gas-fired absorption chillers ramp and cover the cooling gap until CHP-driven absorption reaches full capacity
- **Redundancy and resilience:** Provides backup capacity during maintenance or unexpected generator downtime

### Direct gas-fired absorption chiller



### Key specifications:

| | |
|---|---|
| **Cooling capacity:**<br>Up to 4,500kW (1300TR) | **Fuel:**<br>Natural gas |
| **COP:**<br>1.34 (LHV) | **Electric consumption:**<br>Minimal (0.04kW/ton) |

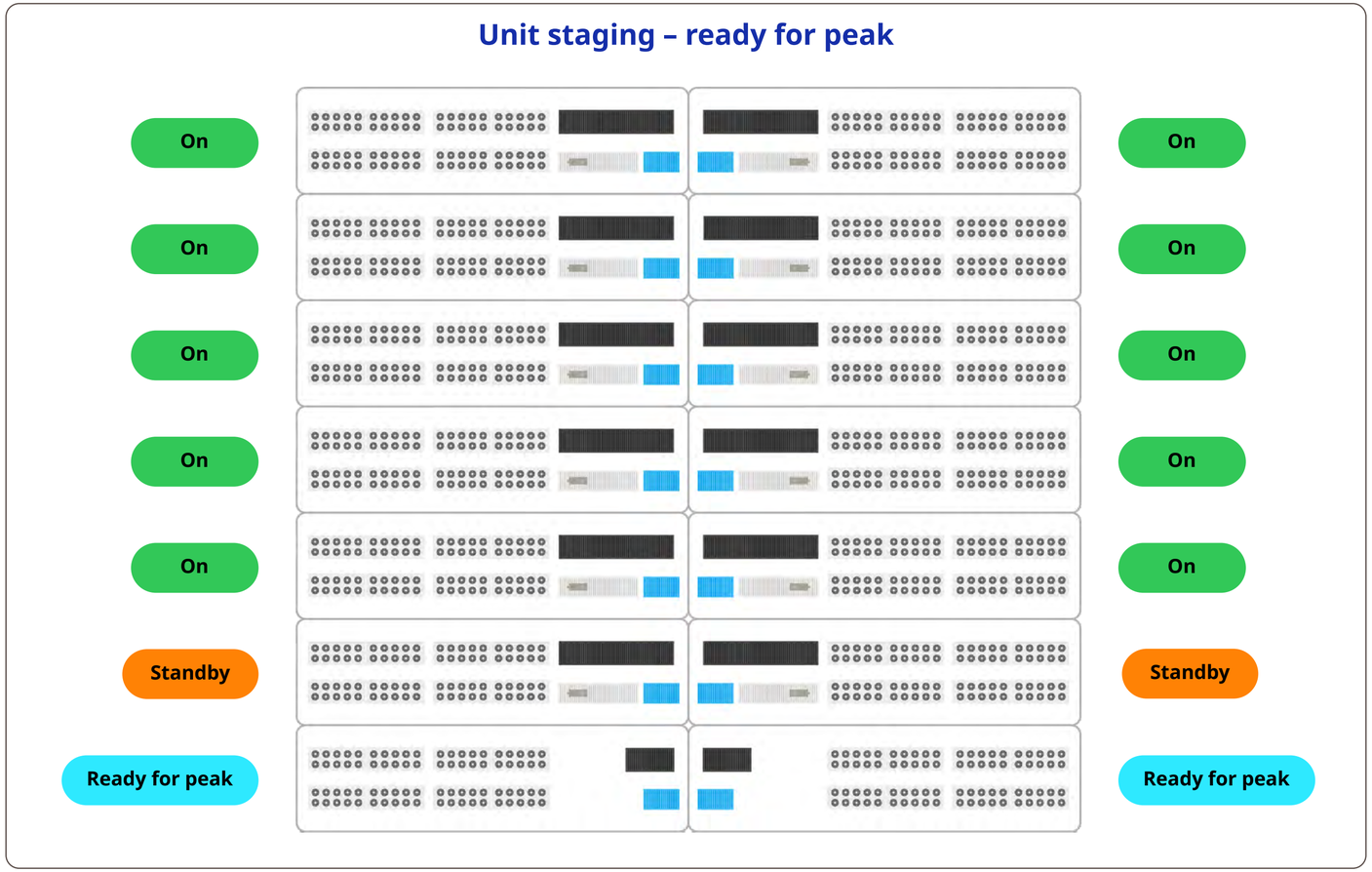
# Sequence of operations

## Stage plant for normal operation, peak demand, maintenance and recovery

**The plant is engineered to maintain continuous cooling under all operating conditions. CHP-driven absorption units handle the base load and direct gas-fired absorption units add capacity during peak or startup. Built-in redundancy supports maintenance and failure recovery.**

### Four operating modes:

- **Normal operation:** Generator-driven absorption units handle the full IT cooling load
- **Peak demand:** Direct gas-fired absorption units add capacity during the hottest conditions and eliminate the need for additional generators
- **Startup / ramp-up:** Direct gas-fired absorption units cover the cooling gap while CHP-driven absorption units warm up
- **Redundancy / planned maintenance:** Redundancy of 10 base + 2 standby + 2 ride through (10 + 2 + 2) ensures continuity if any unit goes offline; units rotate through scheduled maintenance



# Proven technology, trusted expertise

## Absorption chillers, built on decades of innovation and backed by global service

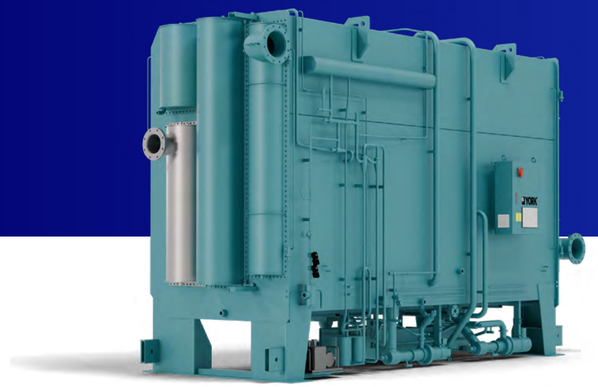
**Absorption chillers are a mature, globally-deployed technology that's built on decades of innovation and operated with reliably at scale. It's all backed by global service expertise from Johnson Controls. Simple to operate. Naturally sustainable. Engineered to last.**

### Built on proven, sustainable design

**Mature, proven technology:** Decades of operation across industrial, commercial and utility-scale deployments

**Robust by design:** Unique two-step evaporator-absorber design for enhanced reliability

**Naturally sustainable:** Utilizes water as a refrigerant for zero climate impact (GWP = 0)



### Backed by leading Johnson Controls expertise

**Global service network:** Local technicians, parts and support wherever your facility is located

**Lifecycle service expertise:** From design and commissioning to ongoing operation and optimization

**Advanced OEM products:** 65+ years of innovative absorption design owned and manufactured in Johnson Controls factories

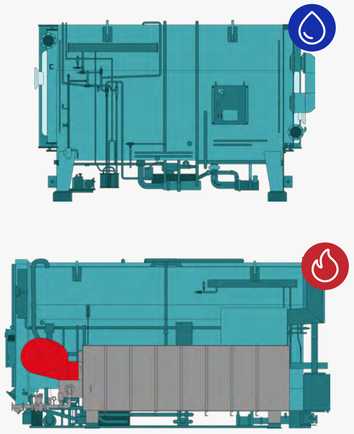
**Trusted partnership:** Trusted by industrial, commercial and mission-critical customers worldwide

# Primary thermal chain elements
## End-to-end cooling efficiency

### CRAH/FCW

Utilize medium-temperature facility water to provide sensible cooling in each data hall.

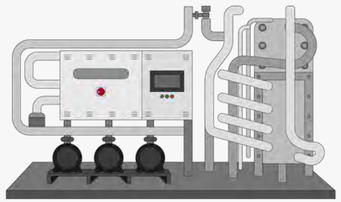


### Absorption chillers

Enable high-capacity, high-efficiency facility water production by reusing the waste heat generated by gas engine or direct-fired natural gas.

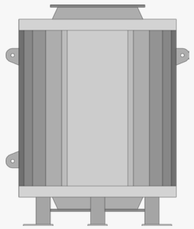
### Dry coolers

Use ambient air to cool the fluid in the heat rejection loop. A greater temperature difference between the heat rejection loop and the ambient air reduces dry cooler power and footprint.



### Coolant distribution units

Utilize high-temperature facility water to provide necessary temperature and pressure for the technology coolant loop.



### Exhaust gas heat exchanger

Can be used to recover heat from generator exhaust gas.

### Thermal controls

Deliver precise automation across temperature, pressure, humidity and airflow. Built-in redundancy strengthens operational continuity. Streamlined compliance assists with automated reporting.

# Silent-Aire® Coolant Distribution Unit (CDU)
## In-row or skid-mounted

### Equipment attributes

**Cooling capacity:**
Up to 10MW

**Approach temperature:**
4°C/7.2°F, or as required

**Supply pressure:**
40psid to TCS loop, or as required

**Temperature range:**
Up to 45°C/113°F supply to TCS

**Power:**
Up to 480V at 50Hz or 60Hz


**CDU is a versatile alternative to traditional air conditioning systems designed to meet the high-performance demands of liquid-cooled AI Factory operators.**

- Flexible and fungible designs
- Smart controls with multi-unit synchronization
- Customization to hyperscale and colocation needs
- Scalable – 1MW, 2MW, 2.3MW, 5MW, 10MW

# Computer Room Air Handlers (CRAH) Fan Coil Walls (FCW)

## **Equipment attributes** – YORK FCW

**Cooling capacity:**
Up to 800kW

**Return air temperature:**
Up to 40°C/104°F

**Airflow limits:**
Up to 125Pa and 90,000CFM

**Power quality:**
IEEE519 compliant

**Power:**
Up to 480V at 50Hz or 60Hz

## **Equipment attributes** – Silent-Aire FCW

**Cooling design as OEM**


**CRAH and FCW solutions meet the air-cooling needs of global colocation data center customers through innovation, consistency and scalability.**

- Compact designs that simplify installation and service
- Integrated controls with a graphical HMI engineered for data centers
- Global manufacturing footprint scales to meet project delivery schedules
- Horizontal and vertical airflow configurations in numerous sizes ranging from 55kW to 800kW

# YORK YHAU absorption chiller

## Thermally driven by waste heat from on-site power generation

### Equipment attributes

**Cooling capacity:**
Up to 7MW

**Waste heat sources:**
Hot water, steam or direct fired with natural gas

**Maximum return facility water:**
Up to 50°C/122°F

**Maximum entering condenser water:**
Up to 60°C/140°F

**Power:**
208V, 380V, 400V or 460V

### Value to AI Factories

- **More IT compute per unit of fuel:** Waste heat drives cooling, freeing electricity for compute
- **Competitive PUE with zero water usage:** Optimized efficiency without the water usage tradeoff
- **Naturally sustainable and next generation:** Zero-GWP refrigerant, lower emissions, compatible with multiple power sources

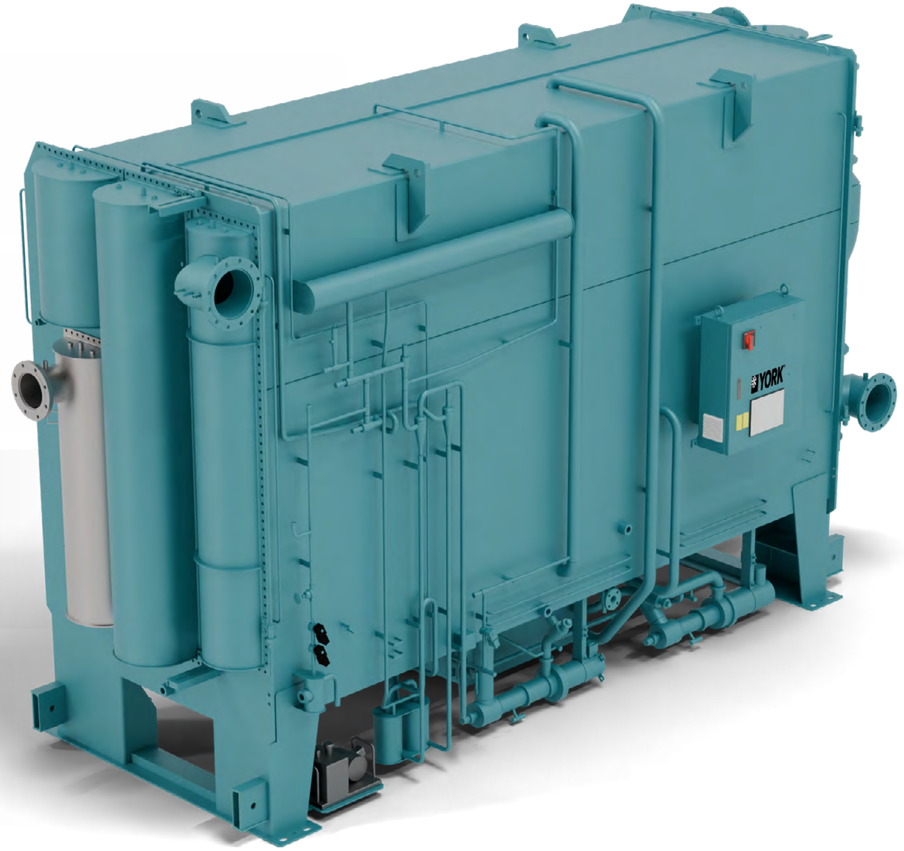
# **Maintain the promise of sustainability**
with YORK absorption chillers

**Dry cooling, no water:** Operates in ambient temperatures up to 55°C/131°F using customized absorption chiller design

**Next-generation performance:** Setpoint adjusts upward for next-generation GPUs; direct-fired absorption adds dependable redundancy

**Zero-GWP refrigerant:** Water as the natural refrigerant lowers operating cost and simplifies servicing

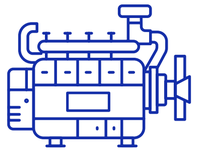
**Lower carbon footprint:** Eliminates emissions tied to additional power-generation equipment

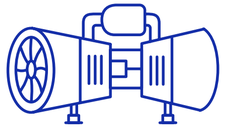


# Flexible by design

## Various absorption solutions for multiple behind-the-meter power sources

**Different power-generation technologies produce waste heat at different temperatures and flow rates. The Johnson Controls absorption chiller portfolio is designed to match each source and enable efficient cooling regardless of the power-generation strategy.**



| | Gas engine | Fuel cell | Gas turbine | Nuclear / SMR |
|---|---|---|---|---|
| Single-effect, hot-water driven absorption chiller | × | × | | |
| Single-effect, steam-driven absorption chiller | | × | × | × |
| Double-effect, hot-water driven absorption chiller | | × | × | × |
| Double-effect, steam-driven absorption chiller | | × | × | × |

# Metasys® controls architecture

## One platform. Full thermal control. Complete visibility.

**Metasys – an open, secure and intuitive building management system from Johnson Controls – delivers intelligent thermal orchestration across the entire AI Factory. It helps optimize performance, efficiency and resilience through fully integrated control, dynamic setpoint management and data-driven environmental stability.**

- **Unified thermal control** across CRAHs, CDUs, chillers, dry coolers, heat exchangers, pumps and valves for fully coordinated air- and liquid-cooling management
- **Dynamic setpoint optimization** that continuously adjusts temperature, humidity and pressure based on real-time IT load and environmental conditions
- **Integrated heat-rejection orchestration** that balances air- and liquid-cooling loops within shared rejection systems to maximize efficiency under any cooling mix
- **Environmental stability** through precise control of supply air, coolant temperatures, humidity and static pressure to protect high-density IT hardware.
- **Continuous sensor-driven feedback** that enables adaptive tuning rather than static control and ensures optimal performance as IT loads fluctuate
- **High reliability and efficiency** with N+1/2N redundancy, centralized monitoring and energy-optimized operation that reduces risk and maintains uptime

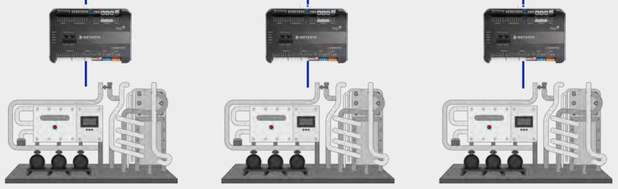
Metasys servers:
2N hardware redundancy

Network

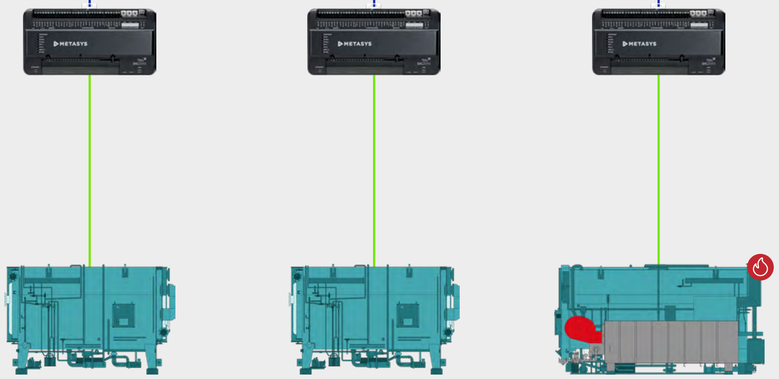
**Air-cooled IT HW**

CRAHs: N+ redundancy

**Liquid-cooled IT HW**



CDUs: N+ redundancy
Technology cooling system 25˚C to 45˚C, PG25%



Chiller array: N- redundancy
Facility medium-temperature system 18˚C to 24˚C, H20 or PG
Facility high-temperature system 25˚C to 32˚C, H20 or PG

Video surveillance

Access controls

Fire protection

EPMS

Integrations
(BACnet, Modbus, OPC, MQTT, API)

# Johnson Controls scale and capabilities
## Global service and products

**Building and operating data centers presents many challenges.** From hundreds of client engagements, we've identified three key obstacles:

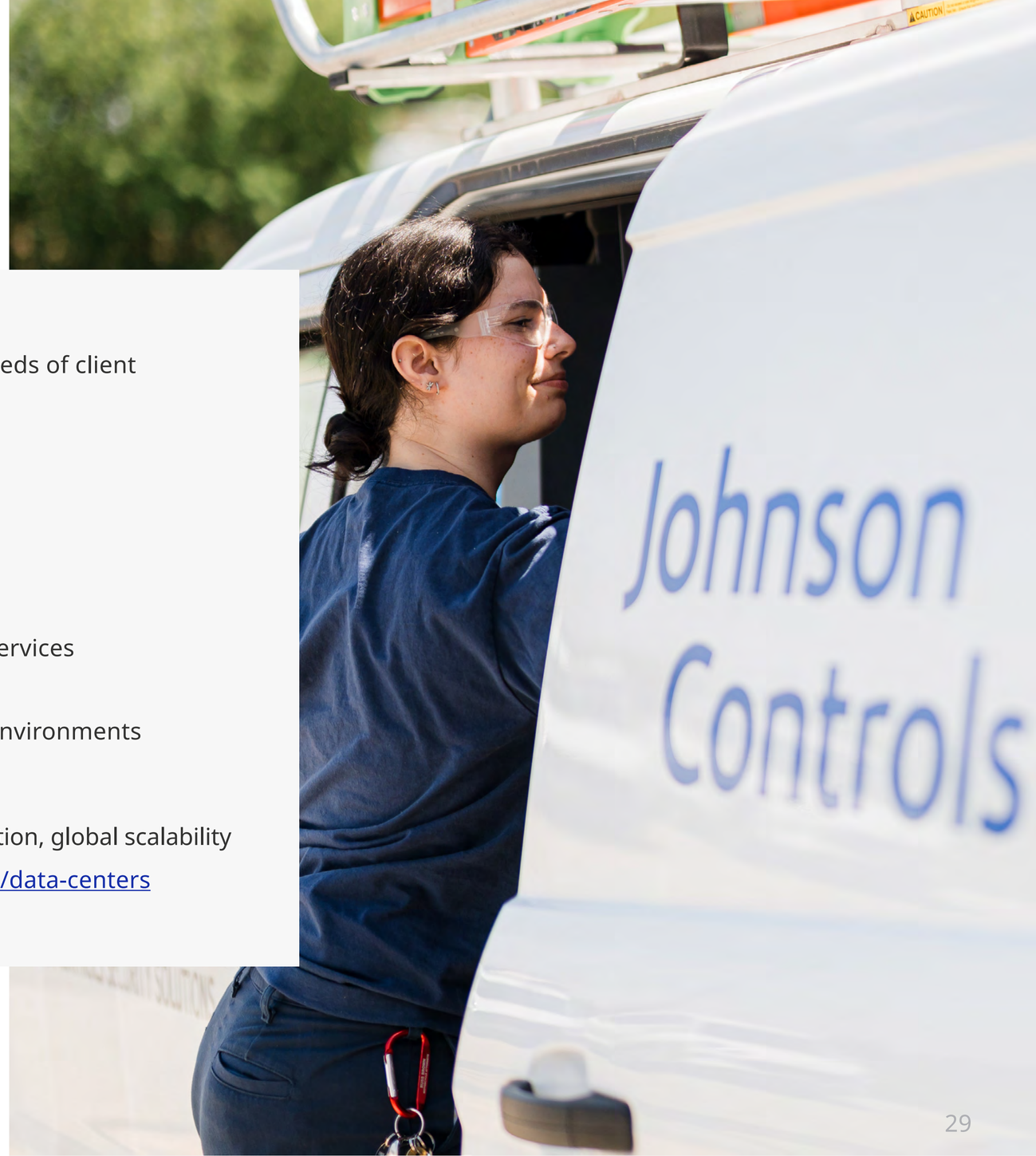
- Keeping pace with rapid technological advancements
- Sourcing products, parts and services globally
- Navigating local regulatory, resource and environmental constraints

We uniquely address these through:

- **Innovation** in thermal management, controls, security, fire protection and services
- **Scalability** via our global manufacturing and service footprint
- **Consistency** in delivering solutions that meet requirements across diverse environments

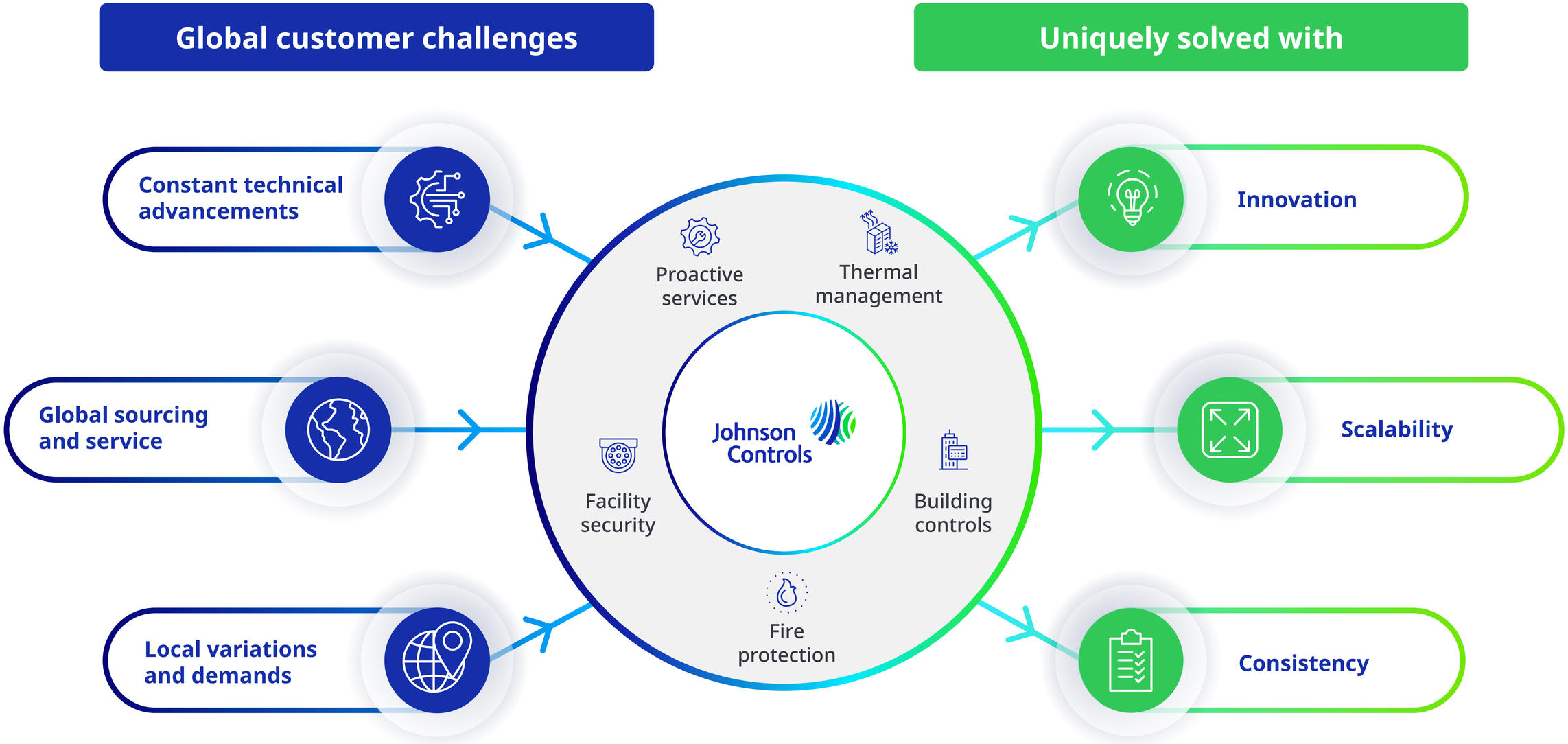
We aim to be your dedicated global data center solutions partner.

Find out more or connect with an expert to learn how our customer-driven innovation, global scalability and engineered consistency can help you: www.johnsoncontrols.com/industries/data-centers

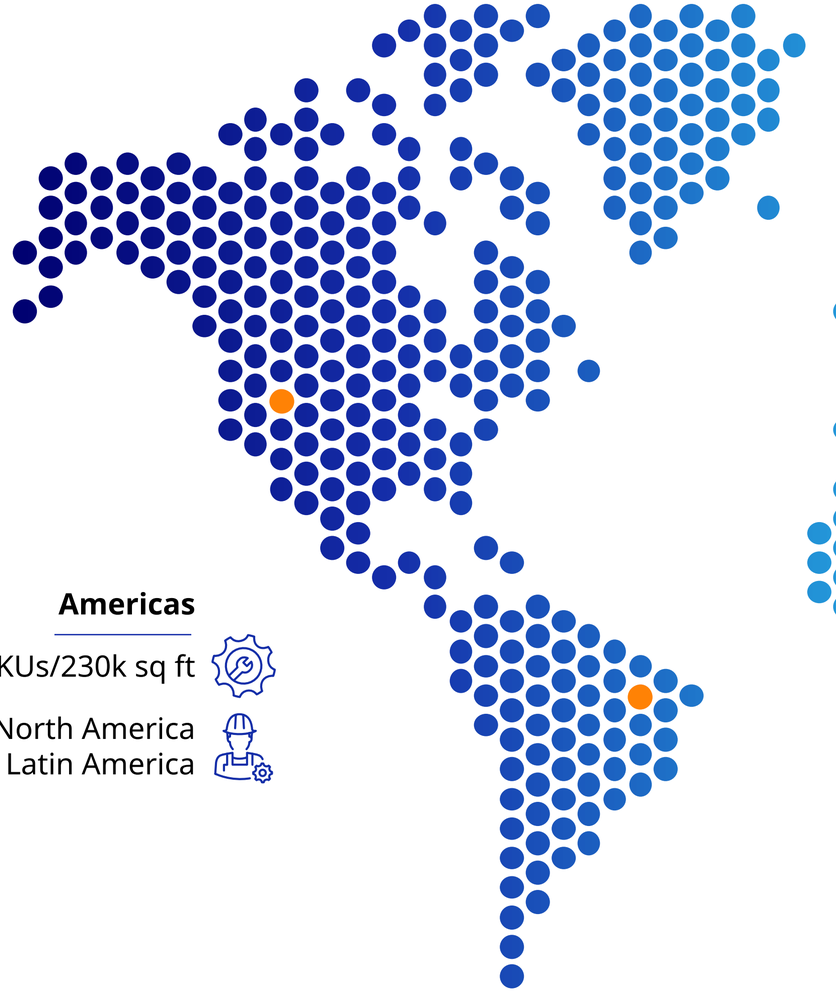


# Your dedicated global data center solutions partner

## Leading the industry through innovation, scalability and consistency



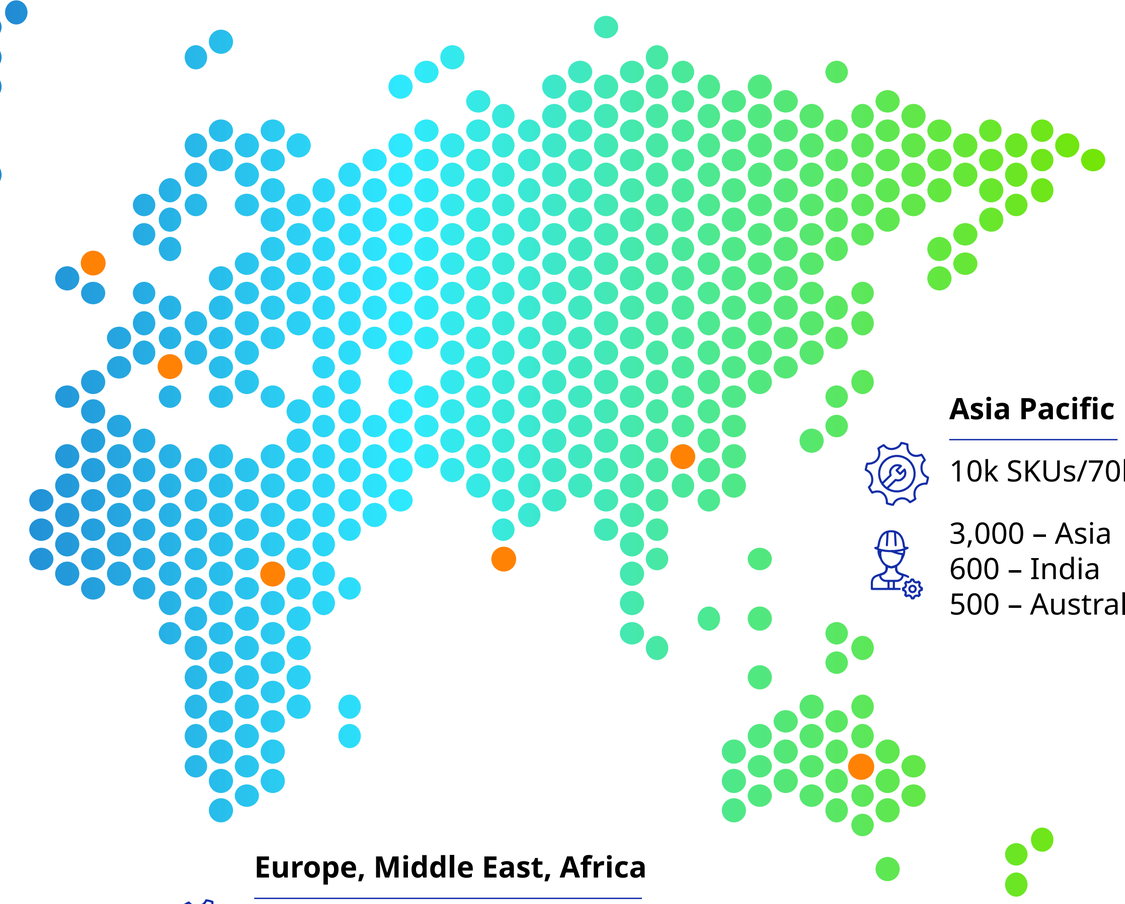
# Local service, global footprint



**Americas**

20k SKUs/230k sq ft

14,000 – North America
1,000 – Latin America



**Asia Pacific**

10k SKUs/70k sq ft

3,000 – Asia
600 – India
500 – Australia and New Zealand

**Europe, Middle East, Africa**

15k SKUs/80k sq ft

3,000 – Europe
2,000 – United Kingdom
600 – Middle East and Africa

Parts distribution

Service technicians

**Find out more or talk to an expert**

Click here

This guide is provided for reference and informational purposes only. The designs, concepts, solutions, and recommendations described herein are illustrative in nature and may not address all site-specific conditions, regulatory requirements, or applicable codes and standards. Any data center design developed based on this guide must be independently reviewed, adapted, and validated by qualified engineers and other appropriate professionals prior to implementation.

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## About Johnson Controls

Johnson Controls, a global leader in thermal management, mission-critical building systems, energy efficiency, and decarbonization, helps customers use energy more productively, reduce carbon emissions, and operate with the precision and resilience required in rapidly expanding industries such as data centers, healthcare, pharmaceuticals, advanced manufacturing, and higher education.

For more than 140 years, Johnson Controls has delivered performance where it really matters. Backed by advanced technology, lifecycle services and an industry-leading field organization, we elevate customer performance, turn goals into real-world results and help move society forward.

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