Multi-Industry: Takeaways from Data Center World

Daniela Costa
+44(20)7774-8354 |
daniela.costa@gs.com
Goldman Sachs International

Ines Lefranc
+44(20)7051-8710 |
ines.lefranc@gs.com
Goldman Sachs International

Joe Ritchie
+1(212)357-8914 |
joseph.ritchie@gs.com
Goldman Sachs & Co. LLC

Mark Delaney, CFA
+1(212)357-0535 |
mark.delaney@gs.com
Goldman Sachs & Co. LLC

Jacqueline Du
+852-2978-1783 |
jacqueline.du@gs.com
Goldman Sachs (Asia) L.L.C.

We hosted a day of investor meetings at Data Center World in Singapore this week. Our trip included booth tours with Alfa Laval, Caterpillar, Cummins (unscheduled), Eaton Corp., Honeywell International Inc., INNIO, Schneider Electric, Shenzhen Envicool Technology, Vertiv and Wartsila (unscheduled). Overall, we note that demand for datacenter equipment remains strong across the board with political and environmental pushback not yet having a real impact on the ground. Capacity is tight but supply chains seem to be holding up and modularisation has emerged as a clear trend crucial for reducing time to market. On 800VDC, product launches are generally being targeted for 1H27 with a broader pick up expected by the end of 2027/ beginning of 2028. Liquid cooling is expected to be crucial for this transition.

Our key takeaways below and deeper dives into each of our covered companies within.

- **Demand for datacenter equipment remains strong and capacity is tight but supply chains are holding up with certain OEMs pre-ordering key components well in advance.** Alfa Laval and Schneider Electric continue to report triple-digit order growth across both training and inference workloads while Eaton's customers are signing 3y capacity agreements (vs previously <1y) and INNIO's customers are reserving slots extending out to 2031. Lead times range from 3-4 months for cooling solutions (Alfa Laval, Envicool) and 9-13 months for low voltage products in the data hall (Honeywell) to 20-24+ months for engines (Cummins, INNIO, Wartsila) and 2.5-3 years for high voltage transformers. All companies are ramping capacity and for now do not see challenges in the supply chain, mitigating potential bottlenecks by pre-ordering components well in advance (Vertiv and Eaton) and leveraging local manufacturing (Vertiv, Schneider, INNIO, Envicool).
- **800VDC product launches are generally being targeted for 1H27 with a broader pick up in the transition expected by end of 2027/ beginning of 2028.** Eaton, Schneider and Vertiv are developing comprehensive 800VDC product portfolios, all of which include solid state transformers (SSTs) and sidecars. Eaton targets 2Q27 for first deployment of its 2.5MW MV SST with a broader industry-wide adoption in late 2027 and Vertiv expects its sidecars to be launched in 1H27. While Schneider anticipates its sidecar to also be introduced next year, it expects LV rectifiers to only be deployed in 2028/2029

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and SSTs by the end of the decade. During its recent CMD, Legrand similarly said that its sidecar would be ready in 2027 while its AI load stabilizer (required for full 800VDC) would only be ready by 2028 (see our takeaways here). Debates remain around where to locate storage (historically at rack level), whether to replace back up facility diesel generators with MV UPS or BESS, whether MV UPS will in fact be needed in full 800VDC architecture (Eaton believes not), which technology to use for load smoothing (Schneider believes sidecars could be) and creation of microgrids for the future.

- **Liquid cooling is expected to be crucial for 800VDC architecture.** Alfa Laval, Envicool and Schneider all highlighted that liquid cooling will be crucial to sustain MW-scale rack loads in 800VDC data centers. Envicool and Vertiv have broad offerings comprising cold plates, piping and CDUs while Alfa is the market leader for copper-brazed heat exchangers used in CDUs (directly supplying eight of the top ten CDU OEMs). Schneider and Eaton have both gained exposure to liquid cooling through acquisitions, namely Motivair and Boyd, respectively, both of which are well integrated. In particular, Schneider offers prefabricated, high-density liquid-cooled AI clusters which combine chillers, CDUs and MV switchgear.
- **Engine and turbine OEMs have different product offerings for base load/back up power but all note high demand and long lead times.** Wartsila supplies heavy-duty 9-24MW gas and/or diesel engines while INNIO's Jenbacher supplies smaller 1.8-4.5MW gas engines and Cummins supplies 1-3.25MW diesel engines. In contrast, Caterpillar's solar turbines span 1-38MW. These sizing strategies dictate physical installation and delivery models with INNIO's smaller engines far easier to containerize and install vs Wartsila's heavy-duty units that are not offered in containerized formats. Despite these varying product approaches, all companies are experiencing unprecedented demand: INNIO has a 15GW order backlog, Cummins has 20-24m lead times, Wartsila has >24m lead times and Caterpillar is fully booked through 2027. While Wartsila and Caterpillar have decided not to take slot reservations, INNIO reports slot reservations extending to 2031. This demand is triggering capacity expansions across the board with Caterpillar increasing engine/turbine capacity by 3x/2.5x and INNIO tripling its annual Jenbacher production capacity. Caterpillar also sees datacenters as most likely having mixed engine/turbine/storage solutions.
- **Modular solutions are becoming increasingly popular as they reduce complexity and accelerate time-to-market.** Eaton reported that modular systems now represent 60-70% of total demand (up from 10-20% in prior years), allowing operators to reduce DC construction times to just 1 year (from 2-3y historically). Similarly, Vertiv has developed standardized offsite-prefabricated 50 MW modular blocks which reduce lead times to 1y. Schneider and Shenzhen Envicool are also providing modular solutions where possible to reduce time to market whilst INNIO are providing containerised engines (enabled by their smaller size relative to Wartsila). By contrast, Honeywell does not offer modular solutions and does not think this will take over much of the market given customers will not want to be locked in with a single supplier.
- **As AI workloads drive up operational criticality of DC infrastructure,**

hyperscalers are bypassing facility managers to secure long-term service agreements directly with OEMs. Vertiv highlighted that customers are directly locking in 15-20y service agreements to guarantee uptime requirements. Similarly, INNIO has secured 20-year service agreements across 100% of its installed base yielding revenues that exceed the initial upfront equipment capex. While Wartsila also offers comprehensive lifecycle services, it manages its contract durations more conservatively, typically limiting agreements to 5-year periods to insulate itself against long-term inflationary risks.

- **Datacenters are under increasing political and environmental scrutiny but there has not yet been a real impact on the ground.** This is highlighted by localized actions such as a two week pause on datacenters in Thailand (mentioned by Schneider) and a community-driven project cancellation in Australia (mentioned by Wartsila but not a Wartsila project). However, other industry players confirm that this political pushback has otherwise not had real impact on the ground. Instead, sustainability has catalyzed a push for renewables PPAs, reduced water usage and advanced generator technologies.

Company-specific takeaways

Alfa Laval (covered by Daniela Costa; hosted by Head of Data Centers)
Alfa has been selling to data centers for 20 years (traditionally supplying large gasketed heat exchangers directly to hyperscalers) and has been tracking customers more closely for 10 years. Data centers now represent 5-6% of group sales and are recording triple digit order growth, with demand seen in both training and inference as well as general cloud computing. Even though the company is building capacity in line with customer expansion, capacity is very tight and lead times span several months; even a 50% market deceleration would not alleviate the fight for product supply in the industry. The company does not see datacenter pushback impacting the environment and while some projects have been delayed due to power constraints, this has been less than originally expected.

As next generation NVIDIA chips reach thermal limits (measured in heat load per square cm), Alfa highlighted the need for direct-to-chip liquid cooling. **While Alfa does not manufacture cold plates, it is the market leader for copper brazed heat exchangers required in CDUs, directly supplying eight of the top ten CDU OEMs** (often not knowing the end customer as they sell to CDU OEMs). The heat exchangers are neither CDU-specific (with CDUs often varying in terms of customization) nor DC-specific (can be used in HVAC, heat pumps and O&G). However, unlike gasketed heat exchangers, there is no aftermarket for liquid cooling.

Looking ahead, the company remains coolant-agnostic and expects to capture more content from emerging technologies including more developed CDUs for higher-MW retrofits, two-phase cooling, cryogenic solutions for quantum computing, re-use of rainwater, and waste-heat recovery for district heating.

Eaton Corp. (covered by Joe Ritchie)
Eaton showcased its 800VDC portfolio anchored by its MV SST (currently 2.5MW and scaling to 5MW) which should be first deployed with a customer in Singapore in 2Q27, with broader 800VDC adoption picking up in late 2027. The SST is designed to lower capital costs by replacing traditional LV UPS and switchgear. Eaton now also offers a sidecar for refurbishment (although this has not yet been sold) and believes that MV UPS may not be needed for full 800VDC. There has also been an industry shift towards prefabricated modular systems that now represent 60-70% of demand (vs 10-20% in prior years) and have helped cut data center construction times to 1y (vs historically 2-3y).

Market demand remains strong with customers signing 3y capacity agreements (vs previously not even 1y) which Eaton does not think includes double-booking. They do not see environmental concerns having a real impact on the ground and are also not worried about Chinese competition, noting that Chinese OEMs are not even used by hyperscalers in Asia given they do not have the service network and uptime guarantee. Eaton has been ramping capacity for 4-5 years and does not see any pressure points in the supply chain having already pre-bought some long lead time components. Eaton sees inflation on components but is passing this through to customers and expects pricing to stabilise at some point.

Honeywell International Inc. (covered by Joe Ritchie; hosted by Head of Asia Building Automation & Head of Global Datacenters)

Honeywell is now a pure play automation provider and has been investing in new products both organically and through M&A with a key focus on data centers. Operating with global key accounts representatives and across eight Asian countries, Honeywell has been capitalizing on the transition of data centers into power-generating assets which increases the value of industrial automation and provides more revenues per square meter than traditional buildings. Data hall building automation and power island were said to each amount to c.2% of total capex (non-construction costs) while general electric is 30% and IT is 50%. Typically, customers look at critical power and electrical ordering when 75% of design is completed. Lead times are up to 2.5-3y for high voltage transformers and 9-13 months for low voltage products in the data hall.

Honeywell's portfolio is concentrated inside the data hall, spanning building management systems (vendor-agnostic), power management systems (cooling chillers and electrical equipment), physical security/ access controls and fire protection (particularly for batteries). Honeywell positions itself as an integrator rather than an equipment provider in the grey space and is not involved in white space mechanical cooling. Key competitors include Schneider Electric, Siemens and JCI as well as Rockwell and Emerson specifically for automation. Honeywell has also partnered with LS Electric (not exclusive) to expand its electrical and BESS footprint, aiming to be a value-added reseller of their products but to also co-develop software.

Honeywell highlighted that modular solutions are becoming increasingly popular and the company can supply controls and automation for these. However, Honeywell does not offer modular solutions themselves and does not think modular will take over much of the market given customers do not want to be locked in with only one supplier.

INNIO (covered by Joe Ritchie; hosted by Head of Asia Sales)

INNIO supplies gas engines (50% natural gas, 50% biogas/hydrogen) through two brands: Jenbacher (five main types of gas engines 0.25-10.4MW) and Waukesha (mainly compression engines 1-3MW). The company first sold engines in Asia 30 years ago and it now has Japan and Indonesia's biggest installed base. While it historically worked with distributors, INNIO is increasingly selling direct to customers and can do engineering, procurement and construction (which they note is a big advantage). It has now been selling its Type 6 engines to data centers for 6 years, providing 1.8-4.5MW (smaller than Wartsila at 10-30MW but easier to containerize and install) primarily for base load power and to a lesser degree back up power.

INNIO has a 15GW order backlog valued at $7bn (64% BTM) and slot reservations extending out to 2031 with demand coming from colocators and IPPs in the US (including Volta Grid) as well as from grid balancing of renewables in Germany/Brazil. The company is tripling its annual Jenbacher production capacity from 1,500 engines produced in 2025 (including 200 type 3, 200 type 4, 1000 type 6 and 120 type 9) to 4,500 by 2030 (including 2000 type 6 in Austria and 1000 in US). This will involve doubling its Austrian manufacturing capacity (where all key components are made) as well as expanding US production. INNIO does not see any changes in customer behavior with these recent capacity announcements. In the US, INNIO primarily sells direct to customer and has 100% market share in several datacenter power ranges, highlighting that it has been difficult for Chinese players to enter. Pricing per MW

depends a lot on scope which itself differs between regions but INNIO disclosed that J620 at 3.5mW typically stands at $4mn.

INNIO's 20y service agreements (which they currently have on 100% of installed base) generate recurring revenues that significantly exceed initial upfront equipment capex. This typically involves 10y of maintenance every 80,000 operating hours then major overhauls done typically three times for an engine.

Schneider Electric (covered by Daniela Costa)

Schneider Electric's data center business is now close to 30% of sales and growing fast, with triple digit order growth and double digit sales growth. Over 60% of DC revenues come from North America, while the rest is evenly split between Europe, South Asia and China. Globally, they see 65% of new builds dedicated to AI workloads although the shift towards AI loads has been progressive, with Asia seeing more inference/less training and more collocation customers. Schneider has not seen supply chain challenges for the moment, nothing that, while the US may have had memory challenges, the company has extra stock and this has not impacted RoW. There has been increased political focus on the industry (exemplified by 2w pause on DCs in Thailand) and sustainability is top-of-mind, marked by a push for renewables PPA and reduced water usage. However, these pushbacks have not impacted Schneider and moratoriums provide time to clean up backlog.

Operating on a regional hub model, Schneider helps customers design, build and maintain datacenters, tailoring equipment for local requirements while also providing modular solutions where possible to reduce time to market. **On the software front, Schneider has been partnering with NVIDIA to develop full 3D data center digital twins that can test architectural changes before physical implementation.** This leverages Schneider's Aveva, ETAP and Power SCADA softwares with NVIDIA's Omniverse. On the hardware front, the company offers primary and secondary MV switchgear (and is scaling its non-SF6 switchgear for increased sustainability) as well as the most compact UPS on the market. **Schneider's 800VDC roadmap features its industry-first 660kV sidecar prototype (to be deployed next year), followed by LV rectifiers (expected for 2028/29) and SSTs (only by the end of the decade).** Schneider highlights circuit breakers as very important (similarly to our data center expert call). Various debates on 800VDC include where to locate storage (historically at rack level), whether to replace back up facility diesel generators with MV UPS or BESS, which technology to use for load smoothing (currently LV UPS but for VDC could be sidecar) and creation of microgrids for the future. **On cooling, integration of Motivair is developing well (with manufacturing in all regions) and Schneider now offers prefabricated high density liquid-cooled AI clusters** (including chillers, CDUs and MV switchgear) which consume less water than traditional air-cooling (big focus in the industry).



Shenzhen Envicool Technology (covered by Jacqueline Du)

Envicool offers NVIDIA-certified air and liquid cooling solutions (including cold plates, piping and CDUs) and expects 800VDC architecture to rely on liquid cooling. They also provide modular solutions globally and energy storage solutions in the US. Products are mostly manufactured in China and Thailand as well as Dallas with lead times currently at 3-4 months. Envicool differentiates itself from Vertiv (its biggest

competitor) on pricing, product customization and lead times (enabled by Chinese supply chains) and has been gaining market share in Asia.

Vertiv (covered by Mark Delaney; hosted by Head of Asia Strategic Accounts)
Vertiv's data center portfolio spans power, thermal and service solutions (vs most peers with 1-2 products) and serves hyperscalers, emerging neoclouds and colocators. The company is getting engaged much earlier in the design process than typical procurement (at around 12m before the decision to build is made) and is trying to move the business more towards a pipeline model rather than acting project-by-project.

To address rising project complexities and time-to-market demands, Vertiv works with general contractors on shell buildings while standardizing offsite-prefabricated, plug-and-play 50 MW modular blocks which maximise Vertiv's share of wallet and reduce lead times (12m time to market). Vertiv is trying to stay ahead of supply chain constraints by pre-purchasing key components 2-3y in advance and by localising its manufacturing footprint (with recent additions to cooling capacity in Malaysia and capability enhancements in Australia and Japan). **As criticality of AI infrastructure increases, customers are securing 15-20y service agreements directly with OEMs rather than facility managers.** Vertiv has 5300 service engineers and leads on liquid cooling service, noting that the current build cycle is creating an enormous installed base for them.

Vertiv is actively developing SSTs and an 800VDC portfolio, with sidecars expected to launch in 1H27 (they are currently talking to data centers that will be 800VDC in 2y time). Vertiv highlights that while the industry has broadened in number of players, it is bifurcating into a few full-suite companies with deep expertise.

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Contributing Authors: Daniela Costa Goldman Sachs International, Ines Lefranc Goldman Sachs International, Joe Ritchie Goldman Sachs & Co. LLC, Mark Delaney, CFA Goldman Sachs & Co. LLC, Jacqueline Du Goldman Sachs (Asia) L.L.C..

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