



# Direct-DC power for AI data centres

Natural-gas turbine-generator packages, built from existing aero engines, designed to deliver 800 V DC directly from the generator to the racks.

## HYPER TECH 100 MW AI DATA CENTRE

Eight-generator campus concept



Concept visualisation • 100 MW design target

### CONCEPT

Concept render: scale-up to a 100 MW or larger data centre with eight generators, minimum white space and minimum 800 V DC copper buses. Not built equipment.

### Next step: an NDA

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THE CONSTRAINT AND THE IDEA

# 800 V DC, available at the generator

Hyper Tech is working to solve the biggest constraint facing AI data centres in the 2027–2033 window: timely access to additional power from natural gas behind the meter, at lower capital cost. Its natural-gas turbine-generator packages are designed to deliver 800 V DC directly from the generator to the racks.

TARGET

16 MW

per unit, with a pathway to 20 MW

CONCEPT

800 V DC

direct from the generator, on multiple isolated buses

MODELLED

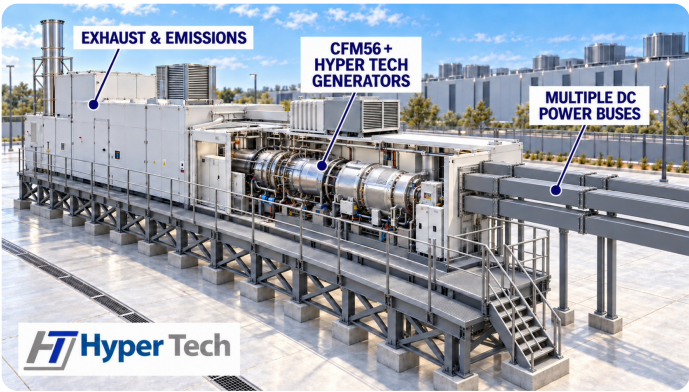
~\$860/kW

data-centre CAPEX saving: about 35% of the equipment cost, ~\$0.86B per GW

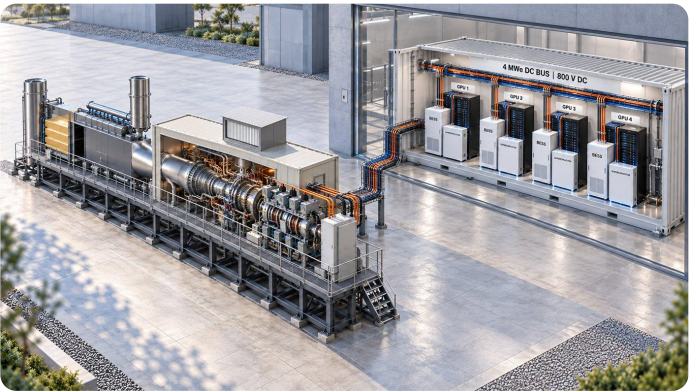
TARGET

Q2 2028

first unit and pilot, built from existing aero engines

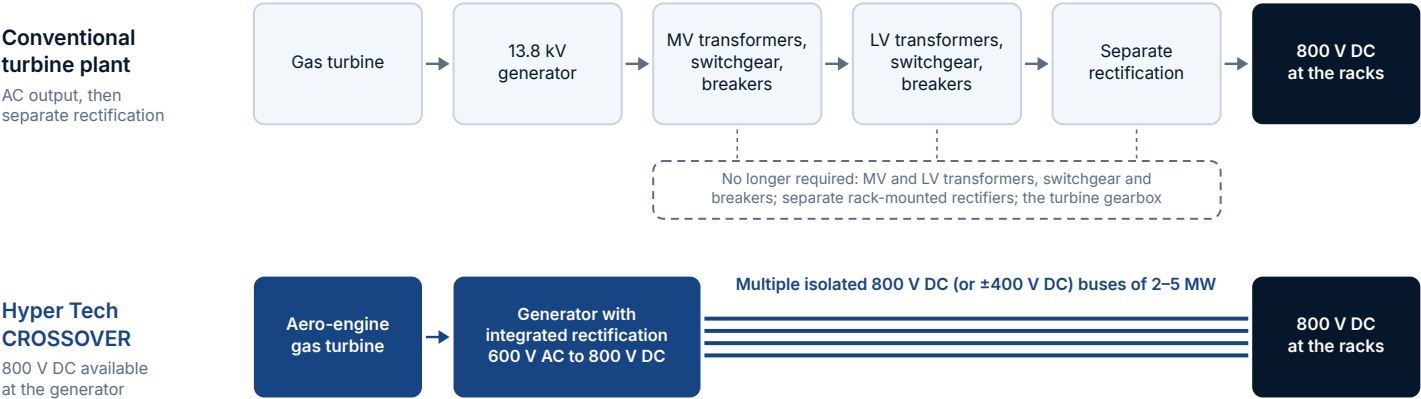


**CONCEPT** 16 MW turbine generator with direct 800 V DC output on multiple isolated buses.



**CONCEPT** Each 4 MVA, 800 V DC bus feeds GPU racks, battery storage (BESS) and supercapacitors: four isolated pods in the data hall ("white space") for NVIDIA 1 MW racks.

TWO POWER CHAINS TO THE SAME 800 V DC



The shortest possible DC buses run to the GPU racks: less real estate, lower losses (no transformer losses) and higher reliability (far fewer components). Future conventional designs: multiple, costly solid-state transformers converting 13.8 kV AC directly to 800 V DC.

|               | CONVENTIONAL TURBINE PLANT                                                                | HYPER TECH CROSSOVER                                                                                                                        |
|---------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Bus isolation | External transformers                                                                     | Inside the generator: 600 V AC converted to 800 V DC, with local fuses and IGBT controls. The generator then feeds multiple isolated buses. |
| Time to power | New turbines largely sold out to 2029–2030; transformers 2.5–4 years (current lead times) | First unit and pilot Q2 2028 (target), built from existing aero engines                                                                     |

INSIDE THE PACKAGE

# Where the cost goes, and what you get



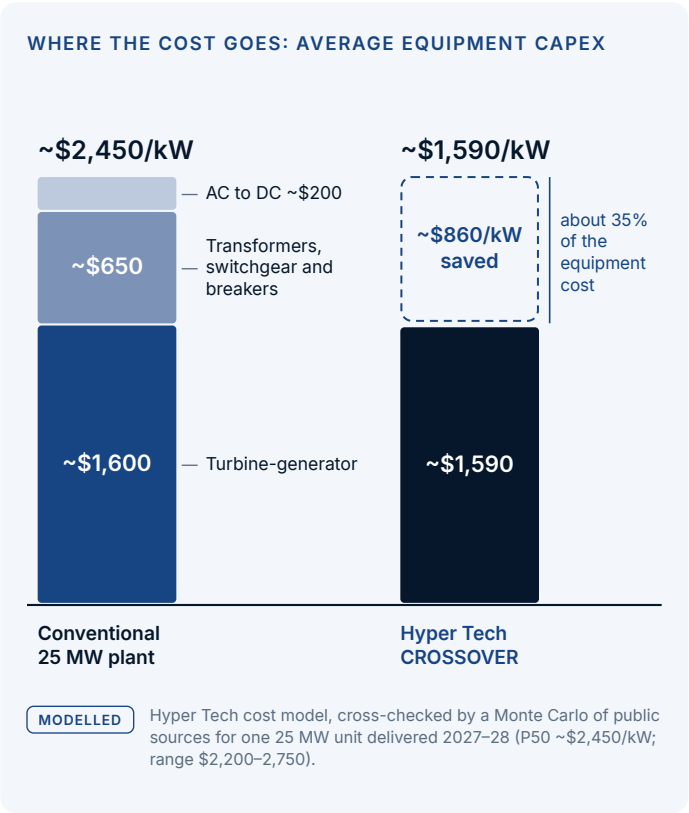
**CONCEPT** Aero core driving Hyper Tech generators with integrated rectification: 800 V DC leaves the generator.

## Equipment cost per kW

- **Conventional 25 MW plant:** ~\$2,450/kW. Turbine-generator ~\$1,600/kW; transformers, switchgear and breakers ~\$650/kW; AC to DC ~\$200/kW.
- **Hyper Tech CROSSOVER:** ~\$1,590/kW. Turbine generator direct to DC.
- **Data-centre CAPEX saving:** ~\$860 per kW, ~\$0.86B per GW: about 35% of the equipment cost.

## What a data centre gets

- **16 MW per unit, with a pathway to 20 MW.** Natural-gas turbine-generator packages for behind-the-meter power.
- **800 V DC from the generator.** Multiple isolated 800 V DC (or ±400 V DC) buses, matching the latest GPU and CPU architectures for NVIDIA, Meta, AWS and Microsoft.
- **Short DC run, no AC cable losses.** Smooth DC output, designed to need no separate filter or condenser.
- **Fewer long-lead items.** Bypasses the transformer backlog and the queue for new turbines, and cuts capital cost.
- **NOx control.** SCR designed for as low as 1 ppm NOx (design target); hydrogen, other fuels and fuel cells on the same buses later.



## Programme and supply

- **Existing aero engines.** A route to purchase rebuilt CFM56 engines is established; modifications in hand; life targeted to match a new gas turbine; \$/kW parity or better.
- **Made in the US.** Design and manufacturing in the United States, close to the customer.
- **Next-generation data centre.** Designed to cut space dramatically, with higher efficiency, fewer components and higher reliability.



| CLAIM STATUS | CONCEPT | proposed design | TARGET | intended outcome | MODELLED | calculation from the Hyper Tech model |
|--------------|---------|-----------------|--------|------------------|----------|---------------------------------------|
|--------------|---------|-----------------|--------|------------------|----------|---------------------------------------|

HOW IT COMPARES

# On-site power options for AI data centres

| OPTION (PUBLIC INFORMATION)                                                                                    | UNIT SIZE           | EFFICIENCY*    | OUTPUT TO THE DATA HALL                                                                                                 | AVAILABILITY                                                                             |
|----------------------------------------------------------------------------------------------------------------|---------------------|----------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| GE Vernova LM2500XPRESS                                                                                        | ~35 MW aero         | ~37–40%        | AC; transformers, switchgear and rectifiers needed for 800 V DC                                                         | Turbine slots largely committed to 2029–2030                                             |
| Siemens Energy SGT-800 with Eaton                                                                              | 60–75 MW industrial | ~40%           | AC; Eaton MV switchgear; DC conversion still needed                                                                     | Joint 500 MW modular offer announced 2025; delivery slots not published                  |
| Baker Hughes NovaLT16 with BRUSH                                                                               | ~16.5 MW industrial | ~35–38%        | AC through a gearbox and generator; DC conversion still needed                                                          | Delivering to Frontier (270 MW) and Dynamis (~1.3 GW) from 2026; new slots not published |
| Caterpillar Solar Turbines (Titan)                                                                             | 10–39 MW industrial | ~35–40%        | AC, integrated with Vertiv; DC conversion still needed                                                                  | Selling to data centres now; deliveries from 2026                                        |
| Natural-gas combustion engines, reciprocating (Cummins, Caterpillar, Wärtsilä, Jenbacher); diesel versions too | 1.5–20 MW           | ~40–50%        | AC; many units, paralleling switchgear and transformers. Diesel is mainly backup: emissions permits limit running hours | Lead times typically 12–18 months for large orders                                       |
| Combined-cycle plant                                                                                           | 100 MW+             | ~55–62%        | AC to grid or site; full conversion chain                                                                               | 4–6 years to operation                                                                   |
| Hyper Tech CROSSOVER                                                                                           | 16 MW, 20 MW upside | 37–39% (model) | 800 V DC direct from the generator, multiple isolated buses                                                             | First unit Q2 2028 (target); existing aero engines                                       |

\*Simple-cycle (or combined-cycle) electrical efficiency on a lower-heating-value basis; approximate public ranges for the class, not OEM guarantees. Hyper Tech figures are cycle-model outputs (Rev 14): 37.1% at 16 MW, 38.9% at 20 MW.

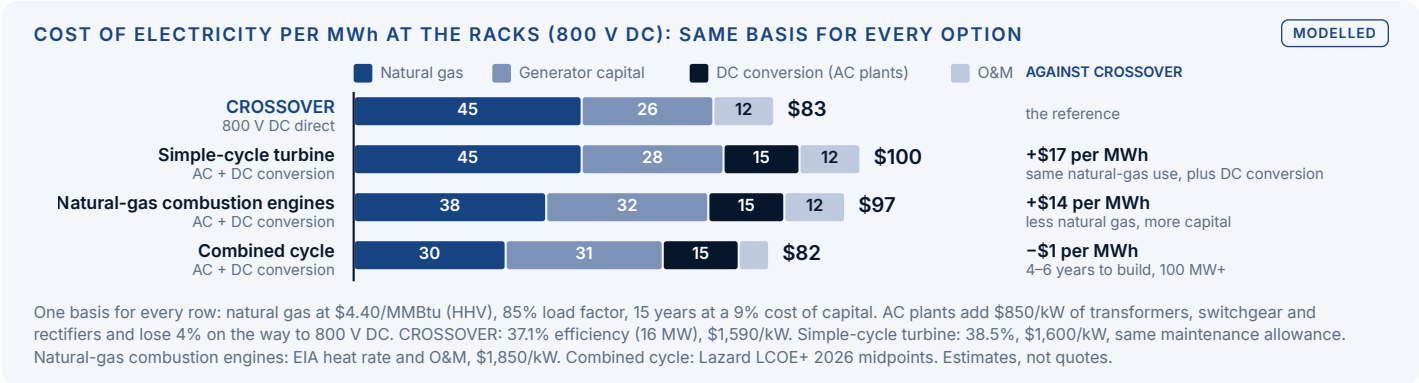
Sources: OEM and industry public releases (GE Vernova, Siemens Energy, Baker Hughes, Caterpillar, Cummins), EIA Annual Energy Outlook, Lazard LCOE+ 2026, SemiAnalysis 2025 and GridLab 2025. Natural gas is priced at \$4.40/MMBtu (HHV). Hyper Tech figures are design targets and model outputs, not guarantees.

## Running cost: natural gas, on one basis

- **The same natural-gas cost as any simple-cycle turbine.** About \$43–45 of natural gas per MWh at \$4.40/MMBtu and 37–39% efficiency, in line with the aeroderivative and industrial turbines bought for data centres today (37–40%).
- **Slightly less at the racks.** AC plants lose 3–5% in transformers and rectifiers; CROSSOVER output is already 800 V DC.
- **Where other options differ.** Natural-gas combustion engines use about \$38 and combined cycle about \$30 of natural gas per MWh, but combined cycle takes 4–6 years to build. Diesel is about \$400 per MWh in fuel at \$6 a gallon: backup only.
- **Turbine Refurbishment Exchange.** Competitively priced ‘core GT’ replacement as a service.

## Total cost of electricity

- **About \$81–83 per MWh at the racks (modelled).** Natural gas \$43–45, capital about \$26, maintenance and core exchange \$12, at 85% load factor.
- **Against a quick estimate.** Natural gas plus the equipment price spread over 10–15 years is about \$59–66. Financing adds about \$12 and maintenance \$12, as for any generator.
- **Lower than an AC simple-cycle plant.** A turbine with DC conversion is about \$100 on the same basis: its conversion chain adds about \$15 and losses about \$3.
- **Further gains.** The 20 MW rematch raises efficiency from about 37% to 39%; a heat-recovery bottoming cycle is under study.



## Next step: an NDA

We then share technical details with data centres and financial information with investors.

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