GREEN TECHNOLOGY GLOBAL, INC.

PTE Turbofans vs. Gas Turbines, Diesel Generators & Solar

Competitive Analysis: Data Center Primary & Backup Power · November 14, 2026 ·

Executive summary

PTE turbofans win on speed to power: a 20 MW block in two 20-foot containers goes from order to first power in about 36 weeks, and the units themselves install in under 24 hours. New gas turbines are sold out toward 2031, reciprocating gas plants take 12–18 months, and grid build-out takes 5–7 years. PTE is also rated for unlimited hours, so one fleet can serve as both primary and backup power.

The market need is clear. Cleanview tracks 59 behind-the-meter data center projects with ~90 GW of planned self-generation, yet only about 2 GW was operating by mid-2026. Grid interconnection runs 36–84 months depending on market. The constraint is no longer demand; it is equipment that can arrive and run.

PTE's trade-offs are a 10-minute start (diesel starts in 10 seconds) and a heat rate of about 9,200 Btu/kWh (~37%), a few points below the best large aeroderivatives. A UPS/battery bridge covers the start, and PTE's speed and density outweigh the efficiency gap for any site waiting on power.

PTE at a glance

PTE's published specs answer most of the questions buyers ask first: output, fuel, efficiency, emissions and cost of energy.

Parameter	PTE 20 MW unit
Net output	20 MW continuous (ISO), 13.8 kV, 3-phase, 60 Hz (50 Hz available)
Prime mover	Aeroderivative turbofan gas generator on Rolls-Royce turbine components; U.S. Patent 9,920,648 B2
Footprint	Two 20-ft ISO containers (800 sq ft) on a 1,000 sq ft pad; 1 GW = 50 units on about one acre
Start to full load	Under 10 minutes from cold, including black start
Heat rate	~9,200 Btu/kWh LHV, simple cycle (~37% efficiency); up to 20% less fuel than conventional generators
Fuels	Pipeline gas, LNG/CNG, dual-fuel diesel/HVO, hydrogen blend; test runs also covered biogas, syngas, flare gas, No. 2 oil and jet fuel
Emissions	Dry low-emission combustion; under 9 ppm NOx at 15% O_2 with SCR (meets BACT in most non-attainment areas); ~50% less CO_2/MWh than diesel; near-zero PM and SOx on gas
Duty and reliability	Unlimited hours, primary or backup; 99.5% target fleet availability; 8,000 h between hot-section inspections; 24/7 IoT/AI monitoring
Time to power	~36 weeks from order (site work, pad, fuel tie-in); units set and commissioned in under 24 hours; air permit 8–16 weeks in parallel
Cost of energy	~$72/MWh all-in on gas at $4.00/MMBtu, vs. $64 recip gas, $88 grid firm tariff, $305 diesel (PTE indicative model)
Commercial terms	Lease, power purchase agreement or sale; monitoring, maintenance and spares under one availability-backed service agreement

PTE's economics rest on speed: a 20 MW block earns about $3.5M a month in data center revenue (at $175/kW-month), so a few months saved outweighs the fuel premium over grid power. Sources: PTE Enterprise data center deck (Portable Turbine Energy LLC, 2026); GTG PTE Turbofan Executive Overview. All PTE figures are indicative manufacturer data.

Side-by-side comparison

PTE leads on time to power, density, duty rating and fuel flexibility; diesel leads on start time; large gas turbines lead on efficiency; solar leads on fuel cost but cannot carry a data center alone.

Factor	PTE turbofan	Gas turbine (aero / frame)	Diesel genset	Solar + battery
Role	Primary and backup (unlimited hours)	Primary (bridge or baseload)	Backup only	Supplemental primary
Unit size	20 MW per 2 × 20-ft containers	35–65 MW aero; 60 MW+ frame	1–3 MW typical	Scales with land
Start to full load	Under 10 min	~5 min (aero); longer for frame	10 s or less	Battery instant; solar daylight only
Order to first power	~36 weeks	Aero 18–36 mo; frame to ~2031	72–104 weeks delivery	18–30 months
Fuels	Gas, LNG/CNG, diesel/HVO, hydrogen blend, flare gas, biogas	Natural gas; some dual-fuel	Diesel (24–72 h on site)	Sun
Efficiency	~37% (9,200 Btu/kWh)	40–43% simple; 53–55% combined	Not a cost driver at 100 h/yr	n/a (no fuel)
Cost of energy	~$72/MWh (PTE model)	$2,000–3,000/kW plant; rising	~$305/MWh run as prime (PTE model); $350/kW + install	~$130/MWh firmed (West Texas case)
Footprint	1,000 sq ft pad per 20 MW; ~1 acre per GW	Large above-ground plant	10–20 units per 20 MW plus fuel storage	4× overbuild; ~11,000+ acres per GW
Emissions	<9 ppm NOx with SCR; ~50% less CO_2 than diesel	Major-source permits at scale	Tier 4 now required in Virginia	Minimal

Sources: PTE specs from the PTE Enterprise data center deck and GTG Executive Overview (2026), PTE Power and PTE fuel list; aeroderivative specs from GE Vernova profile and USP&E LM6000; lead times from GE Vernova backlog report, WoodMac via Pulse and EnkiAI diesel; costs from Utility Dive / EPRI, TechTarget / Cummins and S&P Global. PTE figures are manufacturer claims.

Competitor analysis

PTE vs. gas turbines

Gas turbines are the incumbent for behind-the-meter primary power, but they cannot be bought on a data center timeline. GE Vernova's backlog reached 116 GW in Q2 2026, with heavy-duty units ordered today arriving around 2031; Siemens Energy quotes three years or more. Prices have climbed with the queue: EPRI found average turbine plant costs rose from about $2,000/kW to $3,000/kW in six months.

- **Where gas turbines win:** proven efficiency (LM6000 at 41–43% simple cycle, 53–55% combined cycle vs. PTE's ~37%), decades of fleet hours, lender familiarity.
- **Where PTE wins:** first power in ~36 weeks versus years; 20 MW increments on a 1,000 sq ft pad that grow with the IT load, scaling to 1 GW on about one acre; wider fuel menu; units can be moved to the next site when the grid arrives.
- **Positioning:** PTE is the answer for developers who need power in 2027, not 2031. Even aeroderivative buyers are paying a premium for speed, such as Crusoe's 13-unit, 650 MW ProEnergy order for delivery by summer 2027.
- **Versus reciprocating gas engines:** recips model slightly cheaper energy (~$64/MWh vs. PTE's ~$72/MWh in PTE's own analysis) but need 10+ engines and a large pad per 20 MW and take 12–18 months to energize.

PTE vs. diesel generators

Diesel is the default backup, but it is an idle asset that is getting harder to permit. A diesel genset starts and accepts load in under 10 seconds, which PTE cannot match. Under the EPA's emergency engine rule, diesel units are limited to 100 hours a year of testing and maintenance, so they earn nothing the rest of the year.

- **Where diesel wins:** 10-second start, lowest installed cost (about $350/kW plus installation), full on-site fuel autonomy.
- **Where PTE wins:** one 20 MW block replaces roughly 10–20 diesel units; it is rated for unlimited hours, so the backup asset also earns as primary power; energy at ~$72/MWh vs. ~$305/MWh for

diesel run as prime (PTE model); about 50% less CO_2 and near-zero particulates on gas. PTE can also run dual-fuel diesel or HVO, keeping on-site fuel storage for resilience.

- **Regulatory tailwind:** Virginia now requires new data center air permits filed after July 1, 2026 to meet emissions limits at least as strict as Tier 4. PTE's under-9 ppm NOx with SCR meets BACT in most non-attainment areas.

PTE vs. solar + battery storage

Solar is the cheapest energy per hour of sunshine, but firming it for a 24/7 load is expensive and land-hungry. S&P Global modeled a 627 MW West Texas data center: solar plus storage needed 2,705 MW of panels (4.3× peak load) and a 903 MW, 10-hour battery, at $130/MWh versus $61/MWh for a gas plant. Even then it could not carry multi-day cloudy or snowy stretches.

- **Where solar wins:** no fuel cost, lowest emissions, strong ESG story.
- **Where PTE wins:** dispatchable 24/7 output; ~36 weeks to first power versus 18–30 months; a 1,000 sq ft pad per 20 MW versus roughly 11,200–16,800 acres per GW of continuous load for solar; no dependence on weather.
- **Positioning:** partner, not rival. S&P itself suggests a hybrid of a smaller dispatchable gas unit plus solar and storage. PTE is that dispatchable unit, with a hydrogen-blend path as low-carbon fuel matures.

Primary and backup power: the GTG architecture

GTG's recommended design uses PTE turbofans as primary power, with N+1 PTE blocks and a battery bridge replacing the diesel fleet as backup.

Use case	Best fit	Why
Primary power, no grid for 3–7 years	PTE fleet (N+1)	First power in ~36 weeks; adds capacity 20 MW at a time; unit-level N+1
Primary power with grid available later	PTE as bridge, then backup	Same asset moves to backup and peak-shaving when the utility connects, or relocates to the next site
Backup for a grid-fed site	UPS/BESS + PTE	Battery covers the first 10 minutes; PTE carries long outages without diesel's 100-hour cap
Sustainability-led campus	Solar + BESS + PTE	Solar cuts fuel use; PTE firms nights and cloudy weeks
Short-duration ride-through only	Diesel or BESS	Where a 10-second start and the lowest capex matter most

The GTG package adds four things competitors do not bundle:

1. **Underground installation** of PTE units to cut noise and shrink the visible footprint near neighbors. The prototype measures 95 dB at the unit; enclosure and siting are engineered to meet property-line limits.
2. **Heat and emissions recovery** in a 360° closed loop: turbofan exhaust heat is put back to work, and carbon and NOx are recaptured against Net Zero standards.
3. **Water from the same system:** HVAC water-vapor recovery coupled with GTG atmospheric water generators supplies cooling and site water, reducing draw on municipal supply. Water use is one of the three main permitting risks for AI facilities today.
4. **One EPC contract** covering power, water, cooling utilities, module fabrication and project management, with bonding to $2.2B.

Conclusion and next steps

In a market where turbines and diesel gensets are back-ordered for years, PTE's ~36-week path to first power is the deciding advantage, and one unlimited-duty fleet covers both primary and backup.