

Concept visualization

ON-SITE POWER FOR US DATA CENTERS · 2023–2026

What Behind-the-Meter Power Costs

Prices, scope and lead times for on-site generation and electrical equipment, from 158 dated public data points.

$1,000–1,200
per kW for a delivered 10–50 MW package

$1,450–1,650
per kW with balance of plant

24–33 mo
lead time for a generator step-up transformer

≈ +50%
gas turbine order prices, 2026 vs 2025

Hyper Tech Research, Inc. · Columbus, Ohio · October 2026 · Public sources only

Draft for review. Figures in 2026 US$. Not an offer or a quote.

WHITE PAPER • HTR-WP-001

At a glance

Document	Details
Reference	HTR-WP-001
Version	Draft 2 — 30 October 2026. Key company figures re-checked against primary public sources.
Prepared by	Hyper Tech Research, Inc.
Classification	Public sources only — draft for review before release
Basis	158 dated, sourced data points (84 generation, 74 electrical). All figures in 2026 US$ unless stated.
Shelf life	Gas-generation prices moved 30–50% in the past 12 months. Re-check before relying on any figure.

Bottom line. A delivered 10–50 MW on-site generation package costs about **$1,000–1,200/kW** in 2026, about **$1,450–1,650/kW** with balance of plant, and about **$2,350–2,700/kW** installed. Equipment price is no longer the main constraint. **Lead time is:** generator step-up transformers (24–33 months) and new turbines (24–72 months) now set the date a site gets power.

1. Key findings

- **Packages cluster tightly.** Owner-reported 2026 package prices from mobile-turbine, recip-engine and mixed fleets sit at $930–1,200/kW. Fuel cells are about three times higher at $3,000–3,800/kW.
- **Scope drives the price more than technology does.** Each step adds a sourced amount: equipment to package about +20%; package to package-plus-balance-of-plant +$300–550/kW; balance of plant to installed plant about +$900/kW. Comparing a package price with an installed-plant price is the most common error in this market.
- **Prices are still rising.** OEM gas turbine order pricing for 2026 is up about 50% on 2025. Aero-derivative costs rose about 30% in 12 months. Power and distribution transformer prices are up 91% since January 2020.
- **Time to power decides projects.** Grid connections take 61–84 months. New heavy-duty turbines take 36–72 months, new aero-derivatives 24–36. Rental fleets and converted-aero packages deliver in 1–16 months.
- **The transformer can erase a generation lead-time advantage.** A new generator step-up transformer takes 24–33 months, longer than a converted-aero package. Electrical equipment adds only about $90–110/kW, but it often sets the schedule.
- **800 V DC will move cost inside the data center.** Analyst estimates put solid-state transformers at $1,000–1,500/kW and rack batteries at about $200/kW, replacing about $1,200/kW of central UPS. These are the weakest figures in the dataset (grade D).
- **Demand is overstated, and could turn within a year.** Texas alone has more than 474 GW of large-load requests against a 90 GW peak, junk bonds are nearly half of 2026 data-center debt, and

$68B of projects were blocked or delayed in one quarter. If the pipeline thins, lead times shorten first and prices follow.

- **Delivered energy costs more than grid power.** Modeled year-5 cost for on-site gas is about $101–107/MWh, against about $86/MWh for grid industrial supply. Buyers pay the premium for speed.

2. Scope, sources and method

Every data point comes from a public source: utility board papers and bid tabulations, regulatory filings, integrated resource plans, SEC filings, earnings calls, government datasets and trade press. Each row in the underlying datasets carries the URL, the source date, a quote or table reference, and the calculation for any derived figure.

Scope levels

Level	What it includes
EQ — equipment	Engines, turbines or gensets as sold by the OEM.
PKG — package	Delivered generating package with enclosure, controls and emissions equipment.
PKG+BOP — package plus balance of plant	Adds civil works, gas supply, electrical interconnection on site and installation.
EPC — installed plant	Turnkey or overnight plant cost, including engineering and owner costs; excludes financing.

Table 1 — Scope levels used throughout

Evidence grades

Grade	Meaning	Use in this paper
A	Primary transaction, award or filing with a stated price	Headline statistics
B	Regulatory estimate or reliable secondary report of a transaction	Headline statistics
C	Derived from aggregates (e.g. fleet capex ÷ MW) or a quote that was not completed	Headline statistics, flagged
D	Analyst estimate, vendor claim or modeled figure	Context only; never in medians

Table 2 — Evidence grades

Normalization

- **Escalation to 2026 US$:** generation with the BLS producer price index for turbines and turbine generator sets (annual average; 2025 → 2026 ×1.034); transformers with the power and distribution transformer index; generators with the motors and generators index. 800 V DC, UPS and battery estimates are 2025–26 figures and are not escalated.
- **Currency:** Canadian dollar and euro figures converted at the source-date Federal Reserve rate.
- **Exclusions from statistics:** one islanded data-center plant at $5,000/kW (more than twice the median, with N+x redundancy and its own substations); fleet aggregates that overlap individual rows; superseded owner guidance; and all grade-D figures.

3. What on-site generation costs

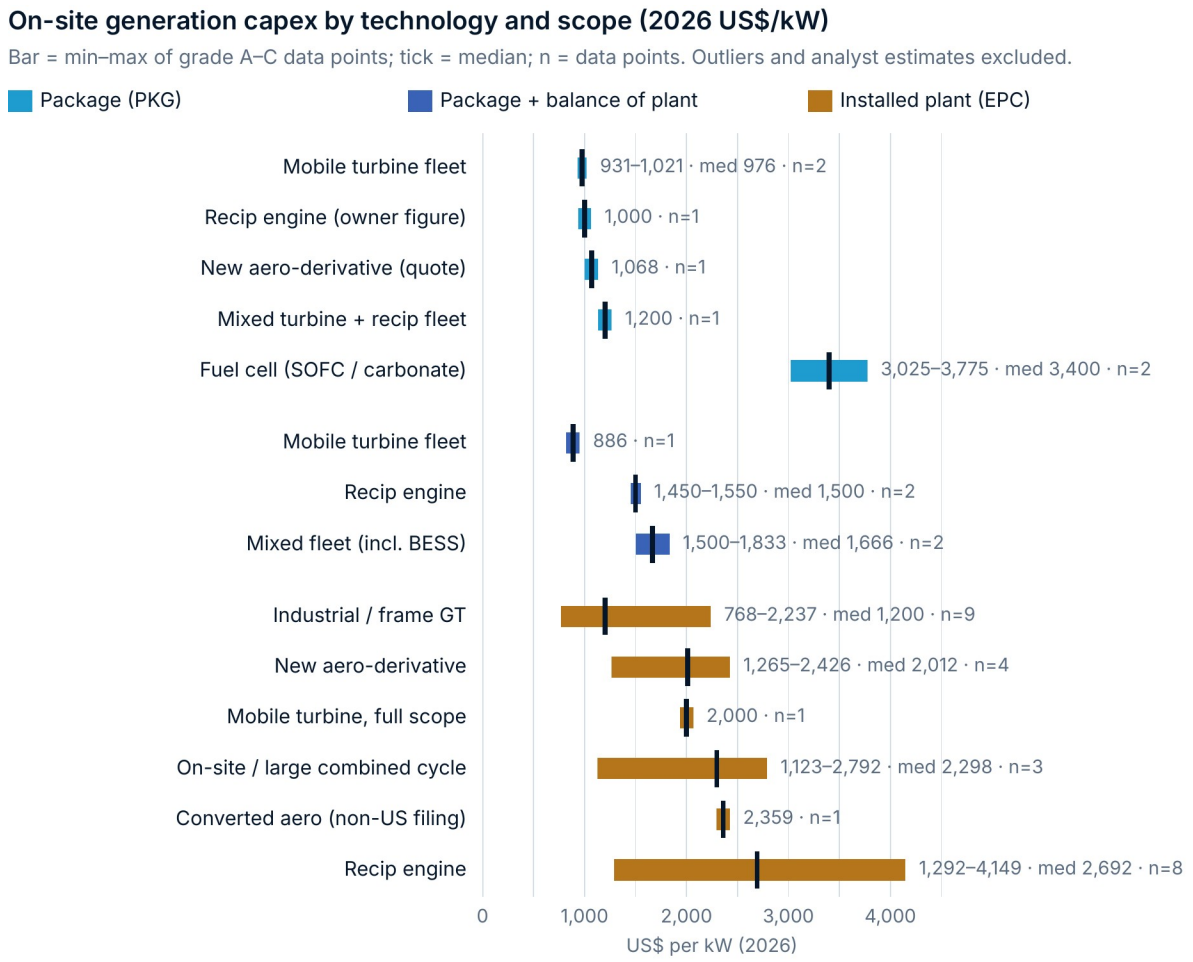


Figure 1 — On-site generation capex by technology and scope, grade A–C data (DesignCraft exhibit)

Technology	Scope	n	Median	Range	Lead time (months)
Mobile turbine fleet	PKG	2	976	931–1,021	1–28
Recip engine (owner figure)	PKG	1	1,000	—	18–36
New aero-derivative (cancelled order, quote only)	PKG	1	1,068	—	30–36
Mixed turbine + recip fleet	PKG	1	1,200	—	—
Fuel cell	PKG	2	3,400	3,025–3,775	~30
Recip engine	PKG+BOP	2	1,500	1,450–1,550	—
Mixed fleet (incl. battery storage)	PKG+BOP	2	1,666	1,500–1,833	—
Industrial / frame gas turbine	EPC	9	1,200	768–2,237	17–60
New aero-derivative	EPC	4	2,012	1,265–2,426	30–36

Technology	Scope	n	Median	Range	Lead time (months)
Converted aero (non-US filing)	EPC	1	2,359	—	15–30
On-site / large combined cycle	EPC	3	2,298	1,123–2,792	24–72
Recip engine	EPC	8	2,692	1,292–4,149	—

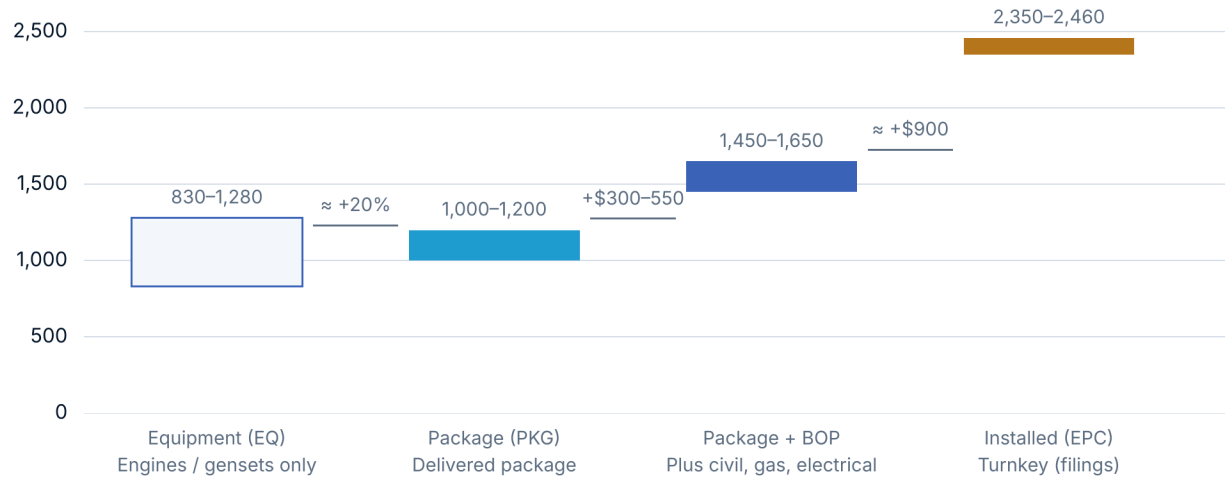
Table 3 — Generation capex summary, 2026 US$/kW, grade A–C

- **Large frame turbines look cheap per kW only at scale.** The industrial and frame median of $1,200/kW installed is driven by 250–800 MW plants. The newest small-frame figure is a 570 MW, ten-unit Texas co-op peaker at $1,202/kW installed, the first public price for that turbine class.
- **Recip engine plants vary most.** Installed cost runs from $1,292/kW (a 366 MW modular plant) to $4,149/kW (a utility plant with interconnection). Small plants of 36–55 MW cost $3,700–4,100/kW.
- **Only one public installed price exists for a refurbished aero-derivative package:** a Canadian utility filing at about $2,360/kW for 2 × 50 MW, including emissions control and medium-voltage switchgear.

4. How scope changes the price

What each scope level adds: 10–50 MW BTM blocks (2026 US$/kW)

Bands from owner and regulatory figures; the labels between bars give each sourced adder.



EQ band: recip equipment awards (Farmington 2024, Ames 2026). Large-frame genset budget price is about $350/kW. EPC band: Idaho Power RICE $2,460; EIA and LM6000 filing aero $2,350–2,430.

Figure 2 — Scope ladder for 10–50 MW behind-the-meter blocks (DesignCraft exhibit)

Step	Adder	Source basis
EQ → PKG	about +20%	Recip equipment at about $820/kW (analyst, grade D) against an owner package figure of $1,000/kW
PKG → PKG+BOP	+$300/kW (+25%) to +$550/kW (+55%)	Two owners reporting both levels on the same call
PKG+BOP → EPC	about +$900/kW (+59%)	Owner $1,550/kW against a 2026 utility plan at $2,460/kW

Step	Adder	Source basis
Large-frame check	Equipment ≈ 45% of installed	Industry budget prices: $325/kW equipment, $713/kW installed

Table 4 — Sourced adders between scope levels

> **Practical rule.** Before comparing two prices, put both at the same scope level. A $1,000/kW "package" and a $2,400/kW "installed plant" can describe the same equipment.

5. Price trend and 2027 outlook

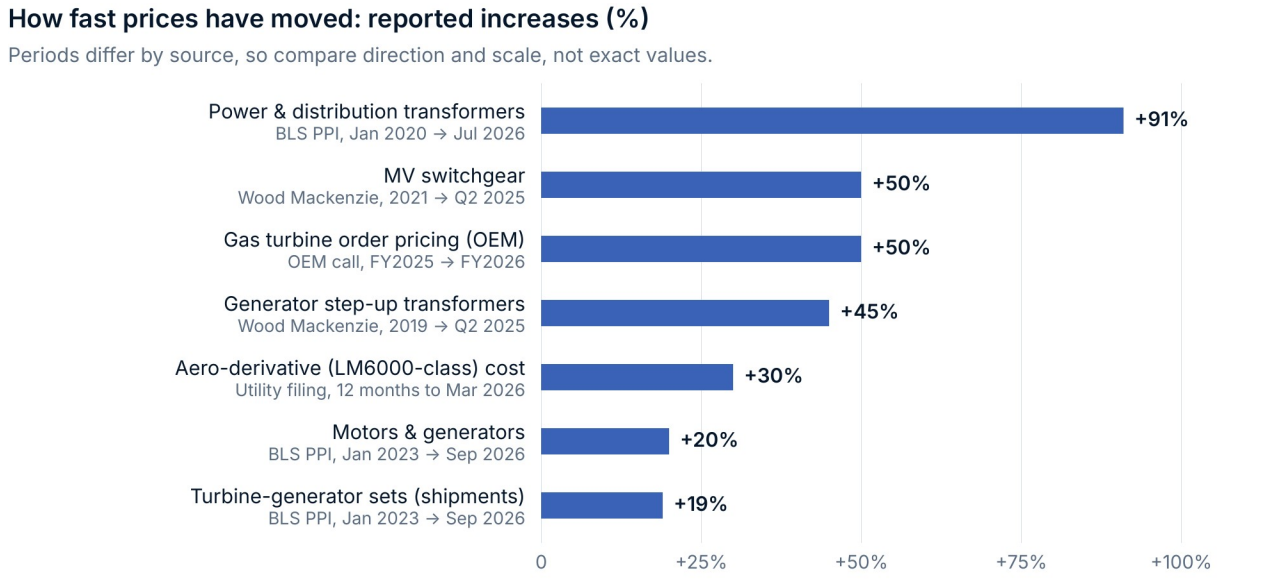


Figure 3 — Reported price increases by equipment class; periods differ by source (DesignCraft exhibit)

Index (FY2025 = 100)	2024	2025	2026	2027 base	2027 downturn
OEM order price (heavy-duty + aero)	≈ 91	100	≈ 150	≈ 155	≈ 105
Aero-derivative only	—	100	≈ 130	—	—
Producer price index (shipments, lags orders)	96.0	100	103.4	—	—

Table 5 — Order-pricing index

- **Order prices lead shipment prices.** The producer price index for turbine-generator sets is up only about 19% since January 2023, because it records equipment shipped against older orders. New orders tell a different story: one large OEM reports 2026 orders priced about 50% above 2025.
- **Base case for 2027:** prices hold near 2026 levels (+3%), taking a $1,100/kW 2026 package to about $1,130/kW.
- **Downturn case for 2027:** if small-unit prices fully followed the OEM index back toward 2025, the same package would fall to about $770/kW. Small fleets have not shown the full +50% rise, so a realistic floor is the 2025 observed level of $900–950/kW.

6. Demand risk: what could change in 12 months

The prices and lead times in this paper describe a market where demand runs ahead of supply. That can change faster than equipment prices do. Much of the headline demand for data-center power is counted more than once: the same campus can appear in several utility queues, in a developer's pipeline, in a packager's backlog and in an EPC contractor's bid list before a single rack is ordered.

Demand signals: requested is not the same as built

Public data, 2026. Each panel compares a headline demand figure with a test of how firm it is.

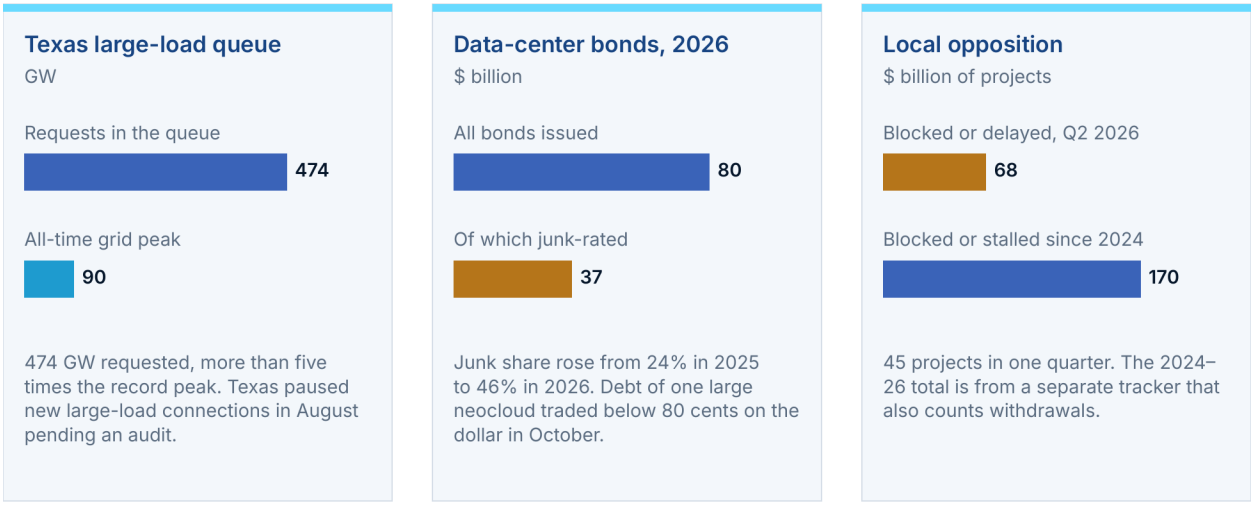


Figure 4 — Demand signals: headline demand against tests of how firm it is (DesignCraft exhibit)

Risk	Public evidence, 2026	What it would do
Demand counted more than once	Texas large-load queue above 474 GW against a record peak of about 90 GW; Texas paused new large-load connections in August pending an audit due in December. Utility forecasts filed with FERC run about 40% above credible industry projections through 2030.	Equipment ordered against duplicate requests is cancelled or resold; slots free up.
Financing strain	About $37B of the $80B of data-center bonds issued in 2026 is junk-rated, against $8.6B of $36B in 2025. One large neocloud's shares fell 25% in a week in October, with about $4B of its debt below 80 cents on the dollar.	Projects without investment-grade tenants slip or are re-priced; developers ask for shorter, cancellable commitments.
Hyperscaler spending plateau	Alphabet held its 2026 capex guidance unchanged on October 28 while signaling a significant increase in 2027; Microsoft kept its calendar-2026 plan unchanged in July.	Growth continues, but fewer new commitments are added at the margin.
Schedules slipping	About half of data-center capacity scheduled for 2026 may slip (Sightline Climate, February); Goldman Sachs expects roughly half of near-term capacity on schedule. Most slips are delays, not cancellations.	Delivery dates move right; the value of a fixed early slot falls.
Local opposition and permitting	45 projects worth $68B blocked or delayed in Q2 2026 (Data Center Watch); more than $170B blocked, withdrawn or stalled since January 2024 (Relae).	Fewer sites reach construction; on-site generation also needs air and gas permits.

Risk	Public evidence, 2026	What it would do
Connection costs and large-load tariffs	Texas SB 6 requires site control, cost coverage and disclosure of duplicate requests; Florida makes data centers over 50 MW pay full interconnection costs; AEP Ohio's tariff makes new data centers over 25 MW pay for at least 85% of subscribed capacity.	Removes speculative requests from queues; raises the cost of grid power for real projects.
Order books include options	One large OEM reported 44 GW of backlog plus 56 GW of slot reservations (Q1 2026). A 29-unit, 1.21 GW turbine order was cancelled in September 2026.	Reservations can lapse without cancellation news; backlog overstates firm demand.
Policy	The November 2026 US midterm elections may change federal energy, trade and permitting policy. The direction is uncertain.	Tariffs on transformer materials and permitting timelines could move either way.

Table 6 — Demand-side risks and their public evidence

What it would mean

- **Lead times move first, prices second.** If a large share of the pipeline does not proceed, turbine and transformer slots free up within months. Order prices follow more slowly, because OEMs are pricing a backlog that runs into 2029–2032.
- **The downturn case in Section 5 becomes the base case for small units.** Package prices would return toward the 2025 level of $900–950/kW, and rental rates would soften.
- **Speed is worth less when everyone can get equipment.** The time-to-power premium in Section 7 narrows if turbine and transformer lead times shorten. Fast options would still win where the grid connection, not equipment, is the constraint, and grid queues are the slowest item in this paper.
- **Buyers should keep commitments short and flexible.** Prefer equipment that can be relocated or resold, check whether a supplier's backlog is firm orders or reservations, and ask for cancellation terms with the price.

7. Time to power

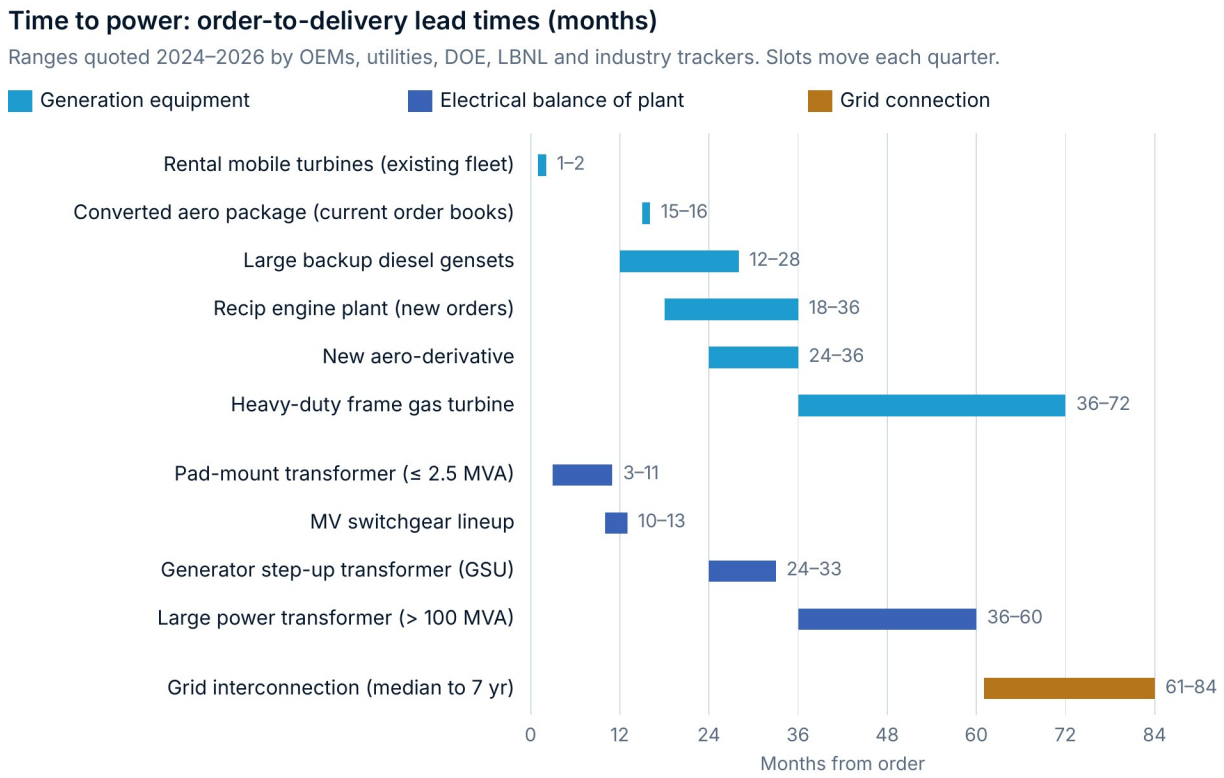


Figure 5 — Order-to-delivery lead times, 2024–2026 quotes (DesignCraft exhibit)

Where the money and the months go on an AC behind-the-meter site

Equipment along the power path, 2026 US$ per kW and order-to-delivery lead time. Public data; ranges, not quotes.



Electrical equipment from the generator to the campus bus is about $90–110/kW, a small share of cost, but the step-up transformer's 24–33 months can set the date power arrives. *Conversion figures are analyst estimates (grade D) for 800 V DC data halls.

Figure 6 — Cost and lead time along the power path of an AC behind-the-meter site (DesignCraft exhibit with Hyper Tech icons)

- **Grid connection is the slowest path.** The median generator built in 2025 took 61 months from interconnection request to operation; large loads in northern Virginia face up to seven years.
- **New turbine slots are sold years ahead.** Heavy-duty turbine makers quote three to four years and more, with some slots in 2032. New recip-engine customers are quoted into the 2030s.
- **Fast options exist but are limited.** Rental mobile turbines can deploy within about 30 days from an existing fleet. Converted-aero packages are being delivered in batches 15–16 months after order.
- **Backup generators are also constrained.** Large backup gensets take 12–28 months, with one major OEM selling into the second half of 2028.

8. Electrical balance of plant

Transformers

Class	2026 $/kVA	Lead time (months)	Evidence
Pad-mount, 0.75–2.5 MVA (12.47 kV → 480 V)	23–28 low bid; 64 domestic OEM	3–11	Utility bid tabs 2024–25 (A)
Substation, 10–20 MVA	65–102	11–27	Municipal awards 2023–25 (A/B)
Generator step-up, 38 MVA	51	24	Utility board award 2025 (A)
Large, 84–300 MVA	20–31	24–36	Utility awards 2025–26 (A/B)

Class	2026 $/kVA	Lead time (months)	Evidence
Generator step-up, 224 MVA (new-unit estimate)	19	up to 60	Refurbisher claim (D)

Table 7 — Transformer prices and lead times, equipment only

- **Prices:** the two federal transformer price indices are up 86% and 91% since January 2020. Industry trackers put power transformers up 77% and generator step-up units up 45% since 2019.
- **Lead times:** generator step-up units average about 143 weeks (33 months). DOE reports 36–60 months for large power transformers. Distribution units have eased to about 30 weeks.
- **Supply:** a 30% shortfall for power transformers and 10% for distribution transformers in 2025, with about 80% of power transformers imported. Section 232 tariffs of 50% on electrical-steel and some copper products took effect in August 2025.
- **Price for speed:** in one 2023 municipal bid, paying 9% more cut about 50 weeks from delivery.

Switchgear and generators

- **Medium-voltage switchgear:** 15 kV metal-clad lineups were awarded at $0.54–0.77M in 2024, with a 13-month lead. Prices are up about 50% since 2021; average lead times are about 44 weeks.
- **Generators sold separately:** no public $/kVA exists. Large generator orders are announced either with a value but no rating, or with a rating but no value. The motors and generators price index is up about 20% since January 2023, far less than transformers. Indian and Latin American makers are adding US-bound capacity.
- **Backup diesel gensets:** about $1,000/kW (grade D); lead times of 60–100 weeks per a 2026 construction-cost guide.

What this means for a 15–20 MW block

1. **Electrical equipment is a small share of cost.** A 25 MVA step-up transformer at about $51/kVA (about $1.3M) plus a 15 kV lineup ($0.5–0.8M) comes to about $90–110/kW, roughly a quarter of the package-to-balance-of-plant adder. Civil works, gas, controls and installation make up the rest.
2. **The step-up transformer sets the schedule.** At 24–33 months it outlasts a 15–16 month generation package. Developers keep the lead-time advantage by connecting at generator voltage (13.8 kV) to the campus bus, ordering the transformer with the package, or using refurbished or stocked units.

9. 800 V DC and what it changes

Item	Cost ($/kW of IT load)	Notes
800 V DC sidecar / power rack	~500	About 10× the current power-shelf content per rack
Solid-state transformer	1,000–1,500	Small units cost 5–10× a conventional transformer
Central AC UPS (being replaced)	~1,200	Comparator
Rack battery backup	~200	Replaces most central UPS content
Total data-center electrical	3,600–4,800	Roughly flat across the transition

Table 8 — 800 V DC equipment estimates (analyst, grade D)

- **Timing:** first small-volume 800 V DC shipments in the third quarter of 2026; full-scale production with next-generation racks in 2027; solid-state transformer orders in late 2026 for shipment from late 2027. One developer has reserved more than 1 GW of solid-state transformer capacity at a target 98.5% efficiency from medium voltage to 800 V DC.
- **Claimed benefits:** up to 5% better end-to-end efficiency, 45% less copper and up to 30% lower total cost of ownership. All are "up to" figures without a stated baseline.
- **Why it matters for on-site power:** facility-level DC moves $1,500–2,700/kW of content into solid-state transformers and batteries. On-site generation that delivers onto a DC bus could displace part of it. The estimates are weak but large compared with a generation package price, so this is worth tracking.



Figure 7 — Concept visualization: 800 V DC buses feeding modules of GPU racks with battery storage (Hyper Tech; not built equipment)

For comparison, the national laboratory estimate for the power-related cost of utility-scale battery storage is $372/kW (2024$); a full four-hour system is about $880–940/kW.

10. Delivered energy and energy-as-a-service

Measure	Value	Basis
Realized fleet revenue, mobile turbines	$44.3 → $47.1/kW-month (Q4-25 → Q1-26)	Segment revenue ÷ revenue-earning MW (C)
Year-5 delivered cost, recip engines	~$107/MWh	Bank model, gas at $3.5/MMBtu (D)
Year-5 delivered cost, aero-derivatives	~$106/MWh	Same model (D)
Year-5 delivered cost, on-site combined cycle	~$101/MWh	Same model (D)

Measure	Value	Basis
Illustrative all-in recip price	~$125/MWh	Market analyst (D)
US industrial grid supply	~$86/MWh	EIA 2025

Table 9 — Delivered cost and service pricing

No on-site power provider publishes a contract price per MWh. The figures above are either revenue rates derived from filings or modeled costs. They show that buyers pay a premium of about $15–40/MWh over grid supply for speed and certainty.

11. Using these numbers

1. State the scope level of every price before comparing it (EQ, PKG, PKG+BOP or EPC).
2. Ask whether a quoted price is an order, a budget estimate or a completed transaction. One headline turbine order in this dataset was later cancelled.
3. Ask for the delivery month, not just the price, and include the step-up transformer and switchgear in the schedule.
4. Check whether the price includes emissions control, black start and medium-voltage switchgear.
5. Escalate older prices with an order-price view, not only the producer price index, which lags orders by one to three years.
6. Treat all 800 V DC, solid-state transformer and battery-rack figures as indicative until the first orders are filed.

12. Gaps and limitations

- **No OEM publishes an absolute $/kW for aero-derivative or turbine packages;** they disclose percentage changes only. The best next sources are state utility commission dockets with unredacted bids.
- **No public $/MW for converted-aero packages.** Management at the leading supplier declined to give one; analyst estimates ($1.0–2.5M/MW) are grade D.
- **No public price for a stand-alone generator, an 800 V DC rack or a solid-state transformer order.**
- **Heat rates are often unlabeled** (higher or lower heating value), and published O&M for mobile or converted units is limited.
- **Several earnings-call quotes come from machine transcripts,** and the only refurbished-aero installed price is Canadian.

13. Principal sources

Full URLs, quotes and calculations for all 158 data points are in the two companion datasets (available on request).

- Utility and municipal awards: Tacoma Public Utilities, Eugene Water & Electric Board, Omaha Public Power District, City of Portland (MI), City of Holton (KS), Fort Pierce Utilities Authority, Fayetteville PWC, Greenville Utilities Commission, City of Ames, City of Farmington.

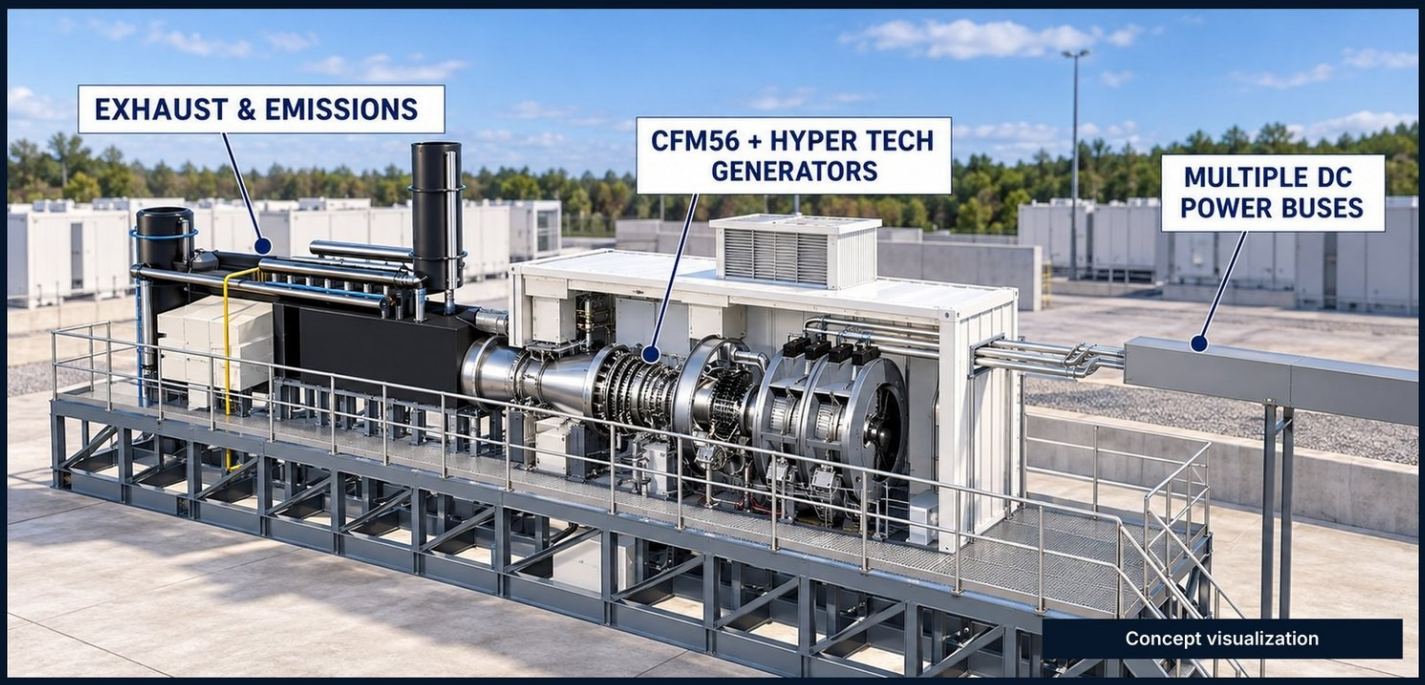
- Regulatory filings and plans: Maritime Electric (PEI IRAC Exhibits M-26, M-28c), Idaho Power 2025 IRP, Montana-Dakota 2024 IRP, East Kentucky Power Cooperative (KY PSC 2025-00087), Northwest Power & Conservation Council 9th Plan, PJM TEAC, Texas Energy Fund (Rayburn Energy Station II).
- Government data: EIA AEO2026 assumptions; US DOE Large Power Transformer Resilience Report (2024); NREL battery cost projections (2025) and distribution-transformer demand study; LBNL Queued Up 2026; CRS R48933; BLS producer price indices via FRED.
- Company disclosures: SEC filings and earnings calls of on-site power owners and equipment makers (2025–2026).
- Demand risk: Utility Dive (speculative load and Texas SB 6, citing Grid Strategies and Goldman Sachs); Forbes (data-center bonds, citing Barclays, Oct 16, 2026); Bloomberg via Tom's Hardware (Data Center Watch, Sep 21, 2026); Axios (Sightline Climate, Feb 24, 2026); CNBC (Alphabet and Microsoft capex, Oct 28–29, 2026); CFO Dive (Microsoft, Jul 2026); POWER (AEP Ohio tariff).
- Industry and analyst sources: Gas Turbine World, Wood Mackenzie (via POWER), Lazard LCOE+, RaboResearch, Modo Energy, Cushman & Wakefield, SemiAnalysis (via secondary reports), Utility Dive, Data Center Dynamics.

Hyper Tech

ABOUT THE AUTHOR

Hyper Tech Research, Inc.

Founded in 2001 in Columbus, Ohio, Hyper Tech is a leading manufacturer of MgB_2 and Nb_3Sn superconductor wire, with experience designing superconducting coils, cryogenic systems and high power density motors. More recently, Hyper Tech has been dedicated to products that help the move to a zero-carbon environment.



CROSSOVER

Hyper Tech is developing natural-gas turbine-generator packages, built from existing CFM56 aero engines, designed to deliver 800 V DC directly from the generator to the racks, with no transformers, switchgear or separate rectifiers in between.

This paper describes the market CROSSOVER is being designed for. Its figures are public market data and do not include Hyper Tech estimates.

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