

KRC ENERGY · ANKARA · SEPTEMBER 2026

Why Energy Storage Decides the Data Center Race

Veri Merkezlerinde Enerji Depolamanın Önemi

Hakkı Karacaoğlu

CEO · KRC Energy Consulting & Trading GmbH

Battery cells, modules & storage systems · Power transformers



Power, not compute, is the binding constraint

Chips are being built far faster than the electricity to run them.

\$31.6 tn

Global data center capex 2026–2050

Annual spend rises from ~\$800 bn (2026) to \$1.8 tn (2050). PwC calls power “the binding constraint” in every region.

15 GW

Projected AI power shortfall in 2027

Chip output grows 40–50 % p.a.; available power outside China grows only 10–20 % p.a. (G20, Sept 2026).

> 1,000 TWh

Data center electricity demand by 2030

More than doubling from today — roughly Japan’s total annual consumption. DC demand grew 17 % in 2025; AI sites +50 %.

THE GROWTH GAP

Annual growth rate

AI chip supply

40–50 %

Available power (ex-China)

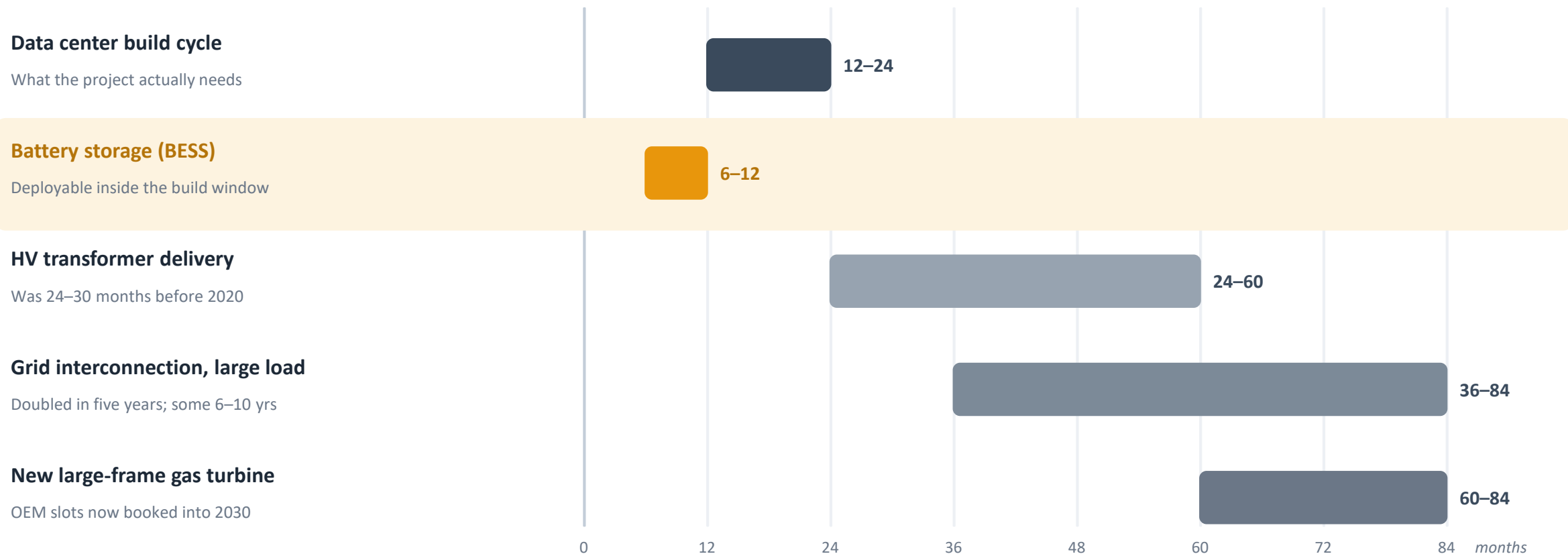
10–20 %

“The faster-rising thing will eventually overwhelm the slower-rising thing.”

Elon Musk, G20 technology session, 1 Sept 2026

The schedule gap that storage closes

A data center is built in 12–24 months. Everything that powers it takes longer — except batteries.



Bottom line: storage is the only power asset that fits inside a data center build cycle — and it shortens the queue itself, by cutting the firm grid capacity the site must contract.

Five jobs storage does in a data center

Behind the meter, one asset earns from several stacked value streams.

1	Speed-to-power / bridge	Serves the load while full grid interconnection is still pending; lets the site contract less firm capacity.	SPEED
2	Load smoothing	Absorbs the synchronised swings of GPU training clusters — tens to hundreds of MW in under a second, at 0.1–3 Hz.	POWER QUALITY
3	Peak shaving	Discharges through coincident system peaks to cut demand charges and reduce contracted grid capacity.	COST
4	Back-up & UPS ride-through	Instant on-site power during outages and curtailment; replaces or de-rates diesel and lead-acid UPS strings.	RELIABILITY
5	Grid services	When not needed on site, aggregated BTM storage dispatches as a virtual power plant for ancillary revenue.	REVENUE

Where batteries win — and where they don't

Volta Foundation, "Where Batteries Can Win in Data Center Applications", July 2026.

WINNING

Speed and daily cycling

● Peak shaving & demand charges

Value depends on the local rate structure — no demand charges, no case.

● Bridge power in a hybrid

As the battery layer of a gas-or-engine hybrid, not standalone.

COMPETING

Software and power electronics have caught up

● Curtailment flexibility

● UPS ride-through

● Grid services

● Sub-second power quality

LOSING

Jobs that demand sustained energy

● Long-duration back-up beyond 4 h

Still goes to diesel.

● Continuous prime power

Gas turbines and fuel cells.

WHAT THE REPORT RECOMMENDS TO DEVELOPERS

Design the hybrid architecture from day one. · Specify the battery for daily duty — back-up capability then arrives as a by-product. · Rank power options on time-to-power alongside levelised cost, because speed decides project viability.

Both halves are being built — separately

The data center pipeline and the storage pipeline are still two different conversations.

THE DATA CENTER PUSH

≥ \$10 bn

Private investment targeted for data centers, cloud and HPC under the National AI Vision & Action Plan 2026–2030

≥ 1 GW

Target for total installed data center capacity in Türkiye by 2030 (from 81 facilities today)

\$3 bn

Turkcell × Google Cloud campus under construction in Ankara — three redundant clusters, full capacity in 2028

THE STORAGE PIPELINE

126.5 GW

Total installed generation capacity (July 2026); renewables at roughly 62 %

33.1 GW

Pre-licences awarded by EPDK across 676 storage-linked wind and solar projects

~3.5 GW

Of that pipeline has reached a generation licence — execution, not ambition, is the bottleneck

THE MISSING LINK

A 33 GW storage pipeline and a 1 GW data center ambition are being planned as two separate markets. Co-designing them is the fastest route to hosting AI load: storage cuts the firm grid capacity a campus must contract, absorbs AI load volatility, and turns a grid constraint into an engineering problem rather than a five-year wait.

IN CLOSING

Three things to take away

01

Power sets the schedule

Compute is no longer the bottleneck. Whoever connects electricity fastest hosts the AI load — and every other constraint is downstream of that one.

02

Storage is the only asset that ships in months

6–12 months against 3–7 years for interconnection and 5+ years for turbines and transformers. It is what makes a 2027 project a 2027 project.

03

Specify for daily duty, hybridise from day one

A battery bought as back-up sits idle. A battery specified for peak shaving, load smoothing and grid services pays for itself — and backs the site up anyway.

Teşekkür ederim.

Hakkı Karacaoğlu · CEO, KRC Energy Consulting & Trading GmbH

Battery cells, modules and storage systems · Power transformers · Cologne, Germany