PART 2 · SECOND EDITION · SEPTEMBER 2026 (FIRST PUBLISHED JULY 2026)

Project Delivery, Schedule, Procurement, Contracts & Risk

The building is the fast part. The transformer, the queue position, and the GPU allocation set the date — and the deposits go out before the design is frozen.

THE DEFINITIVE GUIDE TO
AI Data *Centers*

THE STAKES

~$12–13 B/GW-yr

AI-cloud contract revenue per GW of contracted critical IT a year (SemiAnalysis estimate) — gross, not profit

Contested and single-source — but even the skeptical half of it makes the schedule, not the design, the asset you are managing. Every fork in this deck is priced against this number.

SEMIANALYSIS · AS-OF 2026-06

THE REFRAME

You are not building a data center — you are managing a power-and-silicon critical path with a building attached.

One transformer slot or interconnection date can strand a fleet of GPUs that depreciates whether or not it is ever energized. The schedule, not the design, is the asset.

ACT I

The schedule is the asset

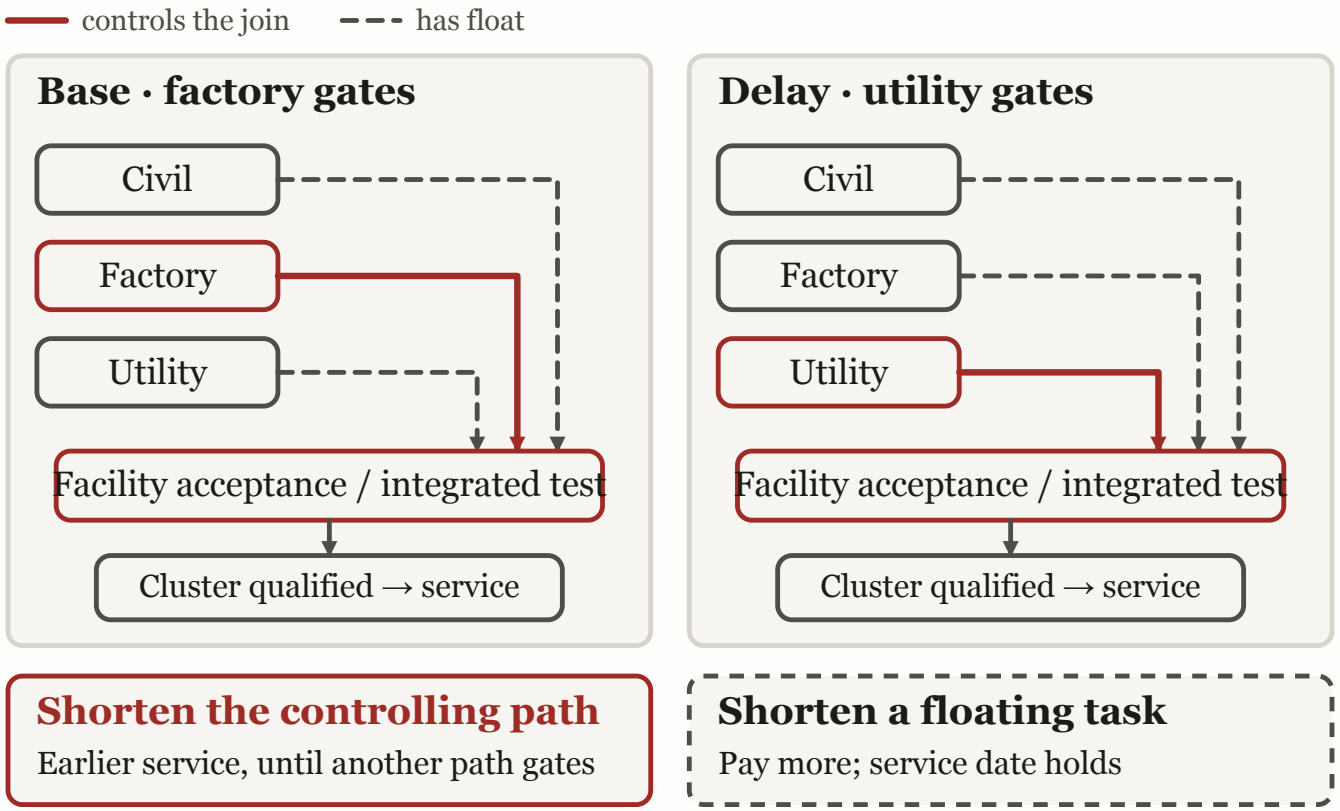
Three tracks run at three speeds — power, building, IT. The slowest one owns the date, and it is almost never the building.

THE TERRITORY

Three tracks at three speeds — the slowest one owns the date

Only the controlling path moves the service date

Illustrative dependencies · order shown, no duration scale



Schematic · Source: Guide derivation · as of Sep 2026

The transformer and the interconnection queue, not the building or the GPUs, set the energization date. The building's float is spent just-in-time; the power track has none.

THE THREE CLOCKS

Why the power track governs

>160 wk

Load-serving HV/substation transformer lead time — not a generation GSU figure

WOOD MACKENZIE · AS-OF 2026-05

18–24 mo

Greenfield hyperscale-campus construction estimate

MASTT, TYPES OF DATA CENTERS · AS-OF 2026-04

THE SCHEDULING DECISION

Back-calculate the release date from the need-by milestone

Median lead duration only

— Deposits go out later; less capital at risk early

— A coin-flip chance the item misses its need-by milestone if the lead distribution is calibrated

— Looks prudent in the board pack — until the tail fires

Risk-adjusted release

— Need-by date minus P90 lead duration, logistics, install/commissioning offsets and explicit float

— Use P50 as an internal target forecast, never as the contractual need date

— For a fixed need-by date, a higher lead percentile can only move release earlier or leave it unchanged

SO WHAT

The asset that strands is not the transformer — it is the GPU fleet, depreciating from the day it ships whether or not it is ever energized.

BETTING BEFORE CERTAINTY

$500k study + $15k/MW

The interconnection deposits go out before the design is frozen — and part is non-refundable

Stage-gate governance exists for exactly this: which irreversible commitment — the deposit, the transformer PO, the GPU slot — is released at which board gate, and who owns the bet.

FERC JUNE 9, 2026 ORDER, ER26-1563-000 · AS-OF 2026-06-09

THE TAIL NOBODY SCHEDULES

The program does not end at ready-for-service

P50: week 60; P90: week 68; latest release: week 2

Cedar's P50 and P90 sit eight weeks apart — the tail the schedule must own

GUIDE SCENARIO · AS-OF 2026-09

~7 days (512-H100 cluster, typical)

Typical ~7-day MTBF SemiAnalysis reported for a 512-H100 cluster — not a scale-up law

SEMIANALYSIS, AI NEOCLOUD PLAYBOOK AND ANATOMY · AS-OF 2024-10

THE DELIVERY-MODEL FORK

Price certainty, or speed against an incomplete design?

Lump-sum EPC / DBB

— A firm price — but only on a finished design

— Contractor carries the cost gap; you pay the contingency in the wrap

— Fits lender-driven, risk-transfer-first projects

Progressive design-build

— Partner selected early on qualifications; GMP firms near design completion

— Fastest collaborative fast-track — the AI default

— Risk shared early, contractor at GMP

EPCM

— Owner holds the packages, the risk, and the savings

— Fast-trackable; pays back across a portfolio

— Needs real in-house controls from day one

SO WHAT

A firm price requires a finished design, and a finished design takes time you do not have while an interconnection slot and a GPU allocation are both burning.

JULY 2024 · NORTHERN VIRGINIA

~1,500 MW

Six faults, 82 seconds — data centers transferred to backup and withdrew grid load on July 10, 2024

The independent CxA and OE are the cheapest line items on the project. Folding the commissioning agent into the EPC scope is the most common owner-side mistake on a liquid-cooled build.

NERC, INCIDENT REVIEW: LARGE LOAD LOSS · AS-OF 2024-07

ACT II

The slot is the asset

Procurement stops being a purchasing function and becomes the master schedule. A slot you reserve today is the date you energize years from now — and re-entering the line costs more than any deposit.

THE LONG-LEAD REGISTER

What you order before the design is done

PACKAGE	LEAD TIME (2026)	WHY IT IS THE LONG POLE
Load-serving HV/substation transformer	>160 wk US substation transformers (Wood Mackenzie, May 2026)	Grain-oriented steel and bushings; 2–3 dominant OEMs
HV circuit breakers	~151 wk (late 2023; Duke August 2025 presentation citing Wood Mackenzie)	Breaker and relay supply concentrated; HV is the bottleneck
Gas turbines (frame-class)	Slots reserved years out	OEM backlog plus reservations — the slot, not the unit, is scarce
Diesel gensets	52–70 wk	Tier-4 engine and alternator supply; OEMs heavily booked
CDUs (liquid-to-liquid, >300 kW)	26–52 wk (CPM Pros planning range, Q1–Q2 2026)	New-and-allocated category; liquid-cooling demand surging
GPU rack systems	Allocation, not a quoted PO	Gated upstream by HBM/CoWoS allocation, not assembly time

THE LONG POLE

3–4 yr

Generator-connected GSU lead time — a generation/export asset, not the site's load-serving step-down transformer

This applies only where on-site generation/export is in scope. Load-serving substation power transformers are a separate equipment category; both face constrained steel, bushings, and factory slots.

SEMIANALYSIS, US GRID CONSTRAINTS, JUNE 25, 2026 · AS-OF 2026-06

UPSTREAM OF THE GPU

The true supply gate is silicon packaging and memory

vast majority contracted

Micron: vast majority of 2027 HBM contracted; prices up YoY (Sep 30, 2026)

MICRON Q4 FY2026 EARNINGS DECK, SLIDE 13 · AS-OF 2026-09

capacity constrained

TSMC packaging limits customer growth — July 16, 2026

TSMC Q2 2026 EARNINGS CONFERENCE TRANSCRIPT, CEO STATEMENT · AS-OF 2026-07

“cloud GPUs are sold out” (Nov 2025)

NVIDIA CEO’s cloud-GPU availability statement — Nov 19, 2025

NVIDIA Q3 FY2026 RESULTS · AS-OF 2025-11

THE DEFINING PROCUREMENT DECISION

Order against a 60% design, or wait for certainty?

Order early

— Release transformer, switchgear and turbine POs before financing closes

— Protects the energization date

— Risks forfeited deposits and rework if the design moves

Wait for the frozen design

— No forfeiture, no rework, cleaner governance

— The manufacturing slot goes to someone else

— Re-entering a years-long queue is the real price

SO WHAT

In an allocation-constrained market the deposit is the cheaper mistake. Size it as schedule insurance and gate it at the board — but place it.

THE THROUGH-LINE

The manufacturing slot — not the equipment, not the money — is the scarce asset. The transformer slot, the turbine slot, the CoWoS allocation, the queue position: all the same object, a place in a line that is years long.

ACT III

Paper, money, and the second underwriting desk

The build runs on a stack of a dozen interlocking agreements, financed against contracted revenue, and insured by a market that now grades your design. Each layer has a seam — and the seams land on the owner.

THE CONTRACT STACK

A dozen agreements — and the risk concentrates where two contracts meet

Risk lives in the seams

The contract stack of an AI data-center deal, from the grid to the cloud tenant

Left bar: grid and power · supply, build and upkeep · service sold onward

Dashed outline: a reservation buys a place in the queue, not a firm delivery date

From the grid ↓

Interconnection agreement + PPA
utility delivers the grid tie · power purchase pricing

seam: energization date

Equipment supply / slot reservation
OEM orders, delivery slots, owner-furnished gear

OEM supply ↔ custody ↔ EPC installation
owner-furnished equipment · highest-risk seam

Retained exposure
Delay damages are capped; the cap covers a fraction of true loss. The rest stays with the owner or operator.

EPC construction contract
builds shell, power & cooling, then hands off to IT fit-out

The costliest line item is the one that no contract covers.

seam: handoff date

Colocation / master service agreement
leases space & power to the operator · uptime terms

O&M contract
keeps it running: maintenance, response, spares

seam: facility and cloud SLA credits must be back-to-back

GPU-cloud SLA
the promise to the tenant: availability & performance

↓ to the cloud tenant

Schematic · Source: Guide synthesis · as of August 2026

The seam between contracts is no one's obligation. The OFE handoff, the LD-cap residual, the facility-SLA-versus-cloud-SLA gap: each lands back on the owner unless written shut.

WHAT YOU CAN ACTUALLY TRANSFER

10-15%

Solar/biogas EPC performance-LD cap as % of price — Husch Blackwell, May 2025

Liquidated damages transfer far less than a stranded GPU build costs. The residual schedule risk sits on the owner's balance sheet whether you priced it or not.

HUSCH BLACKWELL, ANDREW PARKER, CLIMATE SOLUTIONS LEGAL DIGEST · AS-OF 2025

THE GRID-SIDE CONTRACT

The one agreement you cannot renegotiate

$2.7M / MW

Tri-State's rejected 2025 tariff proposal — proposed security deposit

THE COLORADO SUN, REPORT OF TRI-STATE'S REJECTED 2025 LARGE-LOAD TARIFF PROPOSAL · AS-OF 2025

72.5% of a 50 MW contract

AEP Ohio DCT post-ramp billing minimum — price ramp billing separately

OHIO POWER COMPANY, SCHEDULE DCT, SHEETS 223-1 THROUGH 223-6 · AS-OF 2026-09

25 states

US states with an approved large-load tariff governing these terms — more pending

EDISON ELECTRIC INSTITUTE, LARGE LOAD PROJECTS AND TARIFFS, SEPTEMBER 2026, PAGE 12: 25 STATES WITH AT LEAST ONE APPROVED TARIFF, 7 WITH PENDING TARIFFS. · AS-OF 2026-09-11

THE CLAUSE TO HUNT

Force majeure is not a free pass. A transformer factory fire or an export-control change is a foreseeable, recurring 2026 event — not an act of God.

Generic FM lists sweep in supply-chain disruption and change-in-law — exactly the events that define this risk profile. Negotiate them out, or the contract hands you the loss.

THE CAPITAL PROBLEM

~$2.9T / ~$1.5T

The 2025–2028 build, and the share hyperscaler cash flow cannot fund

Half the build competes for a finite pool of outside capital. Contracted revenue — not asset quality — is what sizes the debt, the DSCR covenant, and the advance rate against the GPUs.

MORGAN STANLEY RESEARCH, BRIDGING THE DATA CENTER GAP, 16 JULY 2025. · AS-OF 2025-07

THE LENDER'S MATH

Debt terms follow the sponsor and the contracted cash flows

About 1.5× minimum DSCR; −$19m equity NPV; receipts crossover about $64m/year

Guide case: coverage passes, equity NPV fails; higher receipts reverse the choice

GUIDE SCENARIO · AS-OF 2026-09

15% vs 7% effective (Jun 30, 2026)

CoreWeave's March 2026 facility-rate comparison; use this loan's cash schedule

COREWEAVE FORM 10-Q FOR THE QUARTER ENDED JUNE 30, 2026, NOTE 10 · AS-OF 2026-06-30

THE GATE BEFORE FINANCIAL CLOSE

Insurance is a second underwriting desk: it grades your design before you build it, and delay-in-startup capacity is now the ceiling on your construction program.

An unplaceable DSU layer re-dates financial close. A cooling or battery choice that fails the insurer's loss-prevention bar is repriced, sub-limited, or declined before commissioning.

THE REPRICED RISK POOL

~24%

Share of data-center loss costs now liquid- or water-related — near zero in air-cooled halls

The liquid-cooled, battery-rich AI campus repriced the whole pool. Campuses have outgrown single-carrier appetite; towers are layered, and the sub-limits are a financing input.

SWISS RE INSTITUTE, MARCH 27, 2026 · AS-OF 2026-03

THE CODA

Simulation moves discovery left: a flaw caught in the digital twin costs an engineering revision. The same flaw caught at integrated systems test costs the ready-for-service date.

Score simulation in days protected, not degrees of margin. Validate thermal, electrical, and fabric behavior before steel is cut — the expensive failures live in the coupling.

TAKE IT HOME

What to do Monday

01 Pick the governing milestone — time-to-first-train or first-token — and subordinate every track to it.

02 Back-calculate each applicable release from its need date and risk percentile; keep P50 as an internal target and gate deposits.

03 Keep the commissioning agent and owner's engineer independent of the EPC — the IST is where interface gaps surface.

04 Stand up the lead-time register and reserve slots against the 60% design; the slot, not the equipment, is the asset.

05 Read every force-majeure list for supply-chain and change-in-law carve-ins, and seal the OFE warranty seams.

06 Match power tenor to debt tenor, size debt off contracted revenue, and clear the insurer's bar before financial close.

THE DEFINITIVE GUIDE TO

AI Data *Centers*

The schedule is the asset, the slot is the option on it, and the contracts decide who pays when either slips. The full chapters keep every number here dated and sourced.

Ch 2.1 The integrated master schedule, P50/P90, and stage gates

Ch 2.3 The full lead-time register and allocation dynamics

Ch 2.4 The contract stack, LDs, and the grid-side agreement

Ch 2.5 SPVs, DSCR sizing, and GPU-backed debt

READ THE FULL PART, WITH EVERY SOURCE AND DERIVATION, AT AIDATACENTERGUIDE.COM

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About these figures

Figures are resolved by reference from the guide's claim register at build time (Second edition · September 2026 (first published July 2026)) — a number appears here only as it appears, dated and sourced, at aidatacenterguide.com. Newer data may exist: check the live register.