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Data Center Development & Finance

From Power to Stabilised Value
Course Book

Eight modules, one running case, every figure computed.
Educational material. Not investment advice. Prepared with AI assistance.

MODULE 3

Development cost per MW and phasing

Objectives

- Build a cost per MW line by line and turn it into a budget.
- Explain why the same campus can be quoted at four different costs per MW.
- Phase the spending: campus costs first, then an S-curve per phase.
- Add interest during construction and fees to reach total development cost.

A data center is a power and cooling installation with a roof on it. Its cost scales with megawatts, not with floor area, and the electrical and mechanical plant dominates. The case uses seven lines per MW of IT load, before contingency. They are assumptions of the case, set inside the published ranges and allowing for AI-ready density (the mechanical line includes provision for liquid cooling).

Cost line	$m per MW	Share	Campus total (60 MW)
Land and site works	0.45	3.9%	$27.0m
Substation and grid connection	0.90	7.9%	$54.0m
Shell and core	1.70	14.8%	$102.0m
Electrical: switchgear, UPS, generators	4.60	40.2%	$276.0m
Mechanical: cooling plant and distribution	2.70	23.6%	$162.0m
Fit-out, controls and security	0.50	4.4%	$30.0m
Design, permits and project management	0.60	5.2%	$36.0m
Base cost	11.45	100.0%	$687.0m
With 5% contingency	12.0225		$721.35m

Electrical and mechanical together are 63.8% of the base cost; the shell is 14.8%. Cushman & Wakefield's 2026 Data Center Development Cost Guide put all-in greenfield costs in the United States and Canada between $8.9 million and $23.3 million per MW, excluding IT equipment, after a 21% rise per MW since its late-2024 edition; it reported switchgear, transformers and generators among the fastest rising items.

One campus, four costs per MW

Basis	Denominator	Cost per MW
All in: budget, interest during construction and fees, per IT MW	60 MW	$12.75m
Budget only, excluding land, per IT MW	60 MW	$11.55m
All in, per utility MW	78.0 MW	$9.81m
Budget per IT MW	60 MW	$12.02m

Before comparing two figures, ask three questions: IT or utility MW; with or without land and the grid connection; with or without contingency, interest and fees. The answers can move the number more than any real difference in build cost.

Phasing the spending

Land and site works ($28.35m with contingency) are paid at closing for the whole campus. The substation and grid connection ($56.70m) are paid evenly over the first 4 quarters: the campus needs its power infrastructure before the first phase. Each phase then costs $10.605m per MW, $212.10m per phase, spent over 6 quarters along an S-curve of 10%, 15%, 25%, 25%, 15%, 10%.

Year	Spending
2026 (closing)	$28.35m
2027	$215.78m
2028	$212.10m
2029	$212.10m
2030	$53.03m
Total	$721.35m

Phasing spreads the capital, lets the first phase earn rent while the next is built, and keeps the option to change the specification of later phases. It costs some efficiency: the campus-wide infrastructure is paid early and carried until the last phase leases.

From budget to total development cost

Two items turn the budget into total development cost. Interest during construction: the construction loan's interest from the first draw to the quarter the last phase starts paying rent (Q15), $38.99m, whether it is paid from early rents or capitalized. The arrangement fee on the loan, $4.76m. Total development cost is $721.35m + $38.99m + $4.76m = $765.10m, or $12.75m per MW. This is a convention: interest paid from phase 1's early rent counts as a cost, and that early NOI is not deducted from it. State the convention when you compare a yield on cost with someone else's.

Density and liquid cooling

A design for very dense AI racks moves money into the mechanical line. If the mechanical line rises 30%, the cost per MW with contingency goes from $12.02m to $12.87m, a 7.1% increase. The question for the underwriter is whether the tenant pays for it in rent, and for how long the specification stays current.

Worked example, step by step

1. Base cost per MW: 0.45 + 0.90 + 1.70 + 4.60 + 2.70 + 0.50 + 0.60 = $11.45m.
2. With contingency: 11.45 x (1 + 5%) = $12.0225m per MW.
3. Budget: $12.0225m x 60 MW = $721.35m.
4. Land at closing: 60 x 0.45 x 1.05 = $28.35m. Grid: 60 x 0.90 x 1.05 = $56.70m, or $14.175m a quarter for 4 quarters.
5. Phase 1, $212.10m, spends 25% in its third quarter (Q3): $53.025m.
6. Total development cost: $721.35m + interest during construction $38.99m + fee $4.76m = $765.10m.
7. Per IT MW: $765.10m / 60 = $12.752m. Per utility MW: / 78 = $9.809m.

Pitfalls

- Dividing by utility MW and comparing with a figure per IT MW: the campus looks about 23% cheaper than it is.
- Forgetting interest during construction and fees in the cost used for yield on cost.
- Spreading campus-wide costs (land, substation) across phases: they come first and are carried by the first phase.
- Applying contingency only to hard costs when the estimate is early-stage. State what it covers.
- Assuming a powered-shell figure and a turnkey figure are comparable: one excludes the expensive plant.

Summary

- Electrical and mechanical plant are 64% of the base cost.
- Budget $721.35m; total development cost $765.10m, $12.75m per IT MW.
- Always state the denominator and what is included.
- Campus infrastructure is front-loaded; phases follow S-curves.

In the Exercise Workbook: tab M3 Costs

Practice questions

3.1 With 5% contingency, what is the development budget for 60 MW?

A. $687.00m

B. $765.10m

C. $937.75m

D. $721.35m

3.2 Why does cost per utility MW look cheaper than cost per IT MW?

A. It does not

B. Utility MW excludes land

C. The denominator is larger by the peak PUE

D. Because of contingency

3.3 What does an S-curve represent?

A. The loan repayment

B. The PUE over the year

C. Rent growth

D. The share of a phase's cost spent in each construction quarter