02 / COMPARISON LAB

Power

Connect IT equipment load, PUE, total facility power, utility-grid demand, and on-site generation using one linked planning model.

Controls

IT equipment load (1-300 MW)
Electricity used by servers, storage, and network equipment. This value is linked to total site power through PUE.

Total site power (1-400 MW)
Full-load power for the entire facility, including computing and supporting systems.

Power Usage Effectiveness (PUE) (1.00-1.80)
Ratio of total facility power to IT equipment power. A PUE of 1.25 means 1.00 MW serves IT and 0.25 MW supports cooling, power delivery, lighting, and other systems for every IT MW.

Utility-grid share (0-100%)
Percentage of full-load facility power supplied by the utility. The remainder is shown as owner-generated on site; identify its fuel, emissions, operating hours, and reliability role.

Starting values
100 MW IT load; PUE 1.25; 125 MW total site power; and 80% utility-grid share.

How the estimates are calculated

Total site power = IT equipment load x PUE

- Support-system power: Total site power minus IT equipment load.
- Grid MW: Total site power x utility-grid percentage.
- On-site MW: Total site power minus grid MW.
- Annual energy at full load: Total site power x 8,760 hours.

How to read the result

- Estimated total facility load: Shows full-load demand and the MW serving support systems.
- IT and support bar: Separates computing energy from cooling, power delivery, lighting, and other facility energy.
- Illustrative supply mix: Separates utility-grid demand from owner-generated power on site.
- Annual energy: Assumes the selected full load operates for all 8,760 hours; treat it as a comparison ceiling, not a usage forecast.

Recommended use

- Confirm whether the stated MW is IT load, total facility load, phased capacity, or maximum buildout.
- Use documented design PUE and request annual or seasonal operating estimates in addition to the design target.
- Document interconnection upgrades, reserved capacity, rate class, and who pays each grid cost.
- For microgrids or other on-site generation, document fuel, emissions, expected operating hours, permits, and whether the system is primary, supplemental, or backup power.

Limit
The lab models power relationships at the selected values. It does not forecast load factor, electricity price, emissions, grid reliability, interconnection timing, or ratepayer impacts.