



BEHIND THE CLOUD

EPISODE 2 | QUICK REFERENCE

A data center connects to specific equipment, resources, and institutions, not "the grid" in the abstract.

01 THE BIG IDEA

A large data center can demand as much electricity as tens of thousands of homes, running continuously and arriving faster than utilities typically build new infrastructure. The core issue is whether the full utility system can serve the facility reliably over time, and who bears the cost of the upgrades required.

99.999% = 5 min.

99.999% reliability allows only ~5 minutes of downtime annually

02 UNDERSTANDING SCALE

Electricity and water figures are easy to misread without proper context.



MEGAWATT (MW): Measures the rate power is being used at a given moment.



MEGAWATT-HOUR (MWh): Measures the amount of energy consumed over time.



WATER MEASUREMENT: A gallons-per-day figure means little without knowing if it reflects withdrawal or consumption, average or peak demand, and potable or reclaimed water.

03 WHY CONCENTRATION CHANGES THE SYSTEM

- **CONCENTRATION:** Demand arriving at one site is harder to absorb than the same demand spread gradually across a region.
- **GRID UPGRADES:** Serving a large load may require new substations, transmission upgrades, or additional generation, and these projects often take longer to build than the facility itself.
- **FLEXIBILITY:** Facilities that can shift or reduce load are easier to integrate, provided that flexibility is defined, measurable, and enforceable.
- **COOLING AND WATER:** The cooling technology a facility uses determines its water and electricity tradeoffs, and electricity generation itself carries an indirect water footprint.

The key question:

"What must the utility system commit to build? How certain is the demand behind that commitment?"

04 THE BIG QUESTIONS TO ANSWER

1. **SCALE:** What is the project's initial demand, and what is its demand at full build-out?
2. **TIMING:** How often does demand peak, and how soon must the utility prepare for it?
3. **LOCATION AND DESIGN:** Where will the facility connect, and what cooling system will it use?
4. **COMMITMENT:** What happens if the project is delayed, reduced, transferred, or canceled?

BOTTOM LINE Data centers place substantial new demands on electric and water systems. Their impact depends on where the demand appears, how quickly it arrives, and how the facility is designed. Understanding that connection is the first step toward understanding who pays.