INSIDE THE CLOUD

Data Centers #1 · Teens 10–15

with Dess, the Infrastructure Guard and Lena Ashgrove of Channel 5

CREDITS

Inside the Cloud · Data Centers #1 · Teen edition (ages 10–15)
Story and production: GOTB Consulting, Chicago
Lead: Dess · Heroes: Gridline, Undertow, The Auditor, Commons · On screen: Lena Ashgrove, Channel 5

AI-GENERATED ART, FICTIONAL CHARACTERS

All characters, the town of Prairie Bend and Channel 5 are fictional. Any resemblance to real people is a coincidence. No real logos are shown. Real institutions are described by role. Every number in this book was checked against public sources before printing; see 'Sources' near the end.
Never climb fences, towers or poles, and never enter substations or construction sites. Stay far from downed power lines.

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THE CREW

DESS

Our lead. Follows the cloud down to steel, water and wire.

GRIDLINE

Hero of the grid. Reads the load; cannot make new power.

UNDERTOW

Water guard. Reads every flow.

THE AUDITOR

Sees and reports. Cannot stop anything.

DESS

EVERYONE CALLS IT 'THE CLOUD.' CLOUDS DON'T NEED 1,500 BUILDERS AND A SUBSTATION. LET'S GO INSIDE.

FACT FILE

Also: ~12–18 months to build one building; ~1,500 workers on site at peak.

Source: Virginia JLARC, Data Centers in Virginia (2024)

DESS

EVERY STREAM, SEARCH AND AI ANSWER RUNS ON ROOMS LIKE THIS. NO DATA CENTER, NO INTERNET AS YOU KNOW IT.

FACT FILE

Specialized buildings that manage, process and share large amounts of data; they run websites, apps, email, streaming and cloud platforms. Also: "there is no AI without energy"; AI models are trained and run in large, power-hungry data centres.

Source: Virginia JLARC, Data Centers in Virginia (2024); IEA, Energy and AI (2025)

GRIDLINE

VERIFIED

A TYPICAL AI DATA CENTER PULLS WHAT 100,000 HOMES DO. THE BIGGEST NEW ONES? TWENTY TIMES THAT.

FACT FILE

A typical AI-focused data centre uses as much electricity as 100,000 households; the largest under construction, 20 times that.

Source: IEA, Energy and AI (2025)

LENA (ON SCREEN)

VERIFIED

U.S. DATA CENTERS USED 4.4% OF THE NATION'S POWER IN 2023. BY 2028? SOMEWHERE BETWEEN 6.7 AND 12%.

FACT FILE

Also: ~4.4% of U.S. electricity in 2023. 6.7%–12% of U.S. electricity by 2028 (325–580 TWh).

Source: U.S. Department of Energy, press release on data center electricity demand (Dec 20, 2024)

DESS

IT STAYED FLAT FOR YEARS BECAUSE ENGINEERS GOT SMARTER. THEN AI CHIPS ARRIVED AND THE LINE WENT UP.

FACT FILE

Flat at ~60 TWh 2014–16 thanks to efficiency; growth restarted ~2017 with AI/GPU servers.

Source: Lawrence Berkeley National Laboratory, U.S. Data Center Energy Usage Report (2024)

UNDERTOW

ON-SITE, U.S. DATA CENTERS USED ABOUT 66 BILLION LITERS OF WATER IN 2023. MOST COOLING WATER THAT'S DRAWN ENDS UP AS VAPOR.

FACT FILE

U.S. direct (on-site) water use 66 billion liters in 2023 (≈17.4 billion gallons, GOTB conversion), up from 21.2 billion liters in 2014. Also: ~80% of withdrawn water evaporates.

Source: Lawrence Berkeley National Laboratory, U.S. Data Center Energy Usage Report (2024); Environmental and Energy Study Institute, Data Centers and Water Cons

UNDERTOW

CLOSED LOOPS AND LIQUID-TO-CHIP COOLING SAVE WATER BUT CAN COST POWER. EVERY SITE TRADES ONE FOR THE OTHER.

FACT FILE

Evaporative cooling uses more water but less power; direct-to-chip and immersion liquid cooling use far less water; closed loops cut freshwater use up to 70%; cold outside air ("free cooling") works in cool climates.

Source: Environmental and Energy Study Institute, Data Centers and Water Consumption (2025)

UNDERTOW

AND THE POWER PLANTS FEEDING THEM DRINK EVEN MORE: ABOUT 800 BILLION LITERS BEHIND THE METER.

FACT FILE

Indirect water through power plants ≈ 800 billion liters (2023), far larger than on-site use.

Source: Lawrence Berkeley National Laboratory, U.S. Data Center Energy Usage Report (2024)

COMMONS

ABOUT 1,500 ON SITE AT PEAK, 12 TO 18 MONTHS. AFTER THAT, ROUGHLY 50 RUN THE PLACE, AND THOSE JOBS PAY WELL.

FACT FILE

Also: ~50 full-time workers at a typical 250,000 sq ft site, about half contractors; jobs pay well.
Also: ~12–18 months to build one building; ~1,500 workers on site at peak.

Source: Virginia JLARC, Data Centers in Virginia (2024)

GRIDLINE

CONTESTED

SUMMER 2025, THE CHICAGO-AREA UTILITY SAID BILLS WOULD RISE ABOUT $10.60 A MONTH. THE CAUSE IS STILL ARGUED ABOUT.

FACT FILE

Summer 2025: ComEd power price up 45%; ComEd estimated +10–15%, ~$10.60/month average, for a year. Tied to PJM's capacity auction; CUB blames PJM "policy problems." PJM's independent market monitor concluded data center load growth is "the primary reason" for high capacity prices (+$9.33B, 174.3% on 2025/26 auction revenues). Contested: a consumer group points to market rules.

Source: Citizens Utility Board, news release (Jun 4, 2025); PJM Independent Market Monitor, 2025/26 auction analysis (Jun 3, 2025)

AUDITOR

NEW LINES TAKE FOUR TO EIGHT YEARS. TRANSFORMER WAITS DOUBLED. ABOUT ONE IN FIVE PLANNED PROJECTS COULD BE DELAYED.

FACT FILE

Also: ~20% of planned projects could be delayed by grid limits; new lines take 4–8 years; transformer/cable waits doubled.

Source: IEA, Energy and AI (2025)

COMMONS

SOME WANT THE JOBS AND TAXES. SOME WORRY ABOUT WATER, NOISE AND BILLS. BOTH ARE HERE. BOTH GET HEARD.

FACT FILE

Benefit side: local tax revenue up to 31% of local revenue in mature markets. For: a pause buys time for guardrails (city environment commissioner). Against: it signals investors to go elsewhere (industry coalition), which did not oppose benchmarking.

Source: Virginia JLARC, Data Centers in Virginia (2024); WTTW News (Sep 28, 2026)

LENA (ON SCREEN)

REPORTED

CHICAGO'S PROPOSED PAUSES SIT IN COMMITTEE. A STATE BILL WOULD MAKE DATA CENTERS BRING THEIR OWN CLEAN POWER AND REPORT WATER. LAWMAKERS RETURN IN NOVEMBER.

FACT FILE

A one-year citywide moratorium (mayor) and a six-month one (an alderman) were sent to the Rules Committee on Sep 23, 2026; no hearing as of Oct 15; next Council meeting Dec 8. Would require data centers to pay for their own (renewable) generation, report water, sign community benefits agreements, and be more transparent.

Source: WTTW News (Sep 28, 2026); GrayStak Media, Substack (Oct 15, 2026); Capitol News Illinois (May 30, 2026)

DESS

THE CLOUD IS STEEL, WATER, WIRE AND PEOPLE. ASK WHO BUILDS IT, WHO PAYS, AND WHO CHECKS.

GOTB Consulting works on the infrastructure and procurement behind projects like these.

FACT FILE

Builders look for fiber, reliable affordable power, land, nearness to customers, and tax incentives.

Source: Virginia JLARC, Data Centers in Virginia (2024)

BY THE NUMBERS

4.4%

Share of U.S. electricity used by data centers in 2023. (U.S. DOE)

58 TO 176 TWH

U.S. data center electricity, 2014 to 2023. (U.S. DOE)

6.7–12%

Projected share by 2028, a range, not one number. (U.S. DOE, Contested)

100,000 HOMES

Power used by a typical AI-focused data center. (IEA)

66 BILLION L

On-site water used by U.S. data centers, 2023. (LBNL)

1,500 • 50

Workers at construction peak vs. people running a site after. (Virginia JLARC)

TWO SIDES

The strongest case on each side, labeled. Nonpartisan.

FOR BUILDING

Construction jobs, well-paid staff and local tax revenue.

FOR CAUTION

Water, noise, power bills and grid strain.

IN BETWEEN

Rules on cooling, clean power and reporting water.

WHAT ALL SHARE

A town that asks hard questions in the open.

YOUR TURN

What would you ask at the town hall? _____

CLOUD WORDS

DATA CENTER

A building full of computers that store and send data.

SERVER RACK

A tall frame stacked with computers.

TWH

Terawatt-hour: a billion kilowatt-hours of electricity.

EVAPORATIVE COOLING

Cooling by letting water turn to vapor.

CLOSED LOOP

Cooling that reuses the same water in sealed pipes.

SUBSTATION

Where high-voltage power is stepped down for use.

QUICK QUIZ

1. U.S. POWER SHARE, 2023?

a) 4.4% b) 44%

2. TYPICAL AI DATA CENTER USES POWER LIKE?

a) 100 homes b) 100,000 homes

3. MOST COOLING WATER DRAWN ENDS UP?

a) As vapor b) Back in the river

4. NEW POWER LINES TAKE?

a) 4–8 years b) 4–8 weeks

ANSWERS

1 a · 2 b · 3 a · 4 a

SOURCES

Full list with fact IDs: FACT_BASE.md and NUMBER_CHECK.md (GOTB internal).

U.S. DEPARTMENT OF ENERGY

U.S. Department of Energy, press release on data center electricity demand (Dec 20, 2024)

LAWRENCE BERKELEY NATIONAL LABORATORY

Lawrence Berkeley National Laboratory, U.S. Data Center Energy Usage Report (2024)

IEA

IEA, Energy and AI (2025)

ENVIRONMENTAL AND ENERGY STUDY INSTITUTE

Environmental and Energy Study Institute, Data Centers and Water Consumption (2025)

VIRGINIA JLARC

Virginia JLARC, Data Centers in Virginia (2024)

CITIZENS UTILITY BOARD

Citizens Utility Board, news release (Jun 4, 2025)

ABOUT GOTB CONSULTING

WHO WE ARE

A Chicago firm working on infrastructure and procurement for the systems communities depend on.

DATA CENTERS

Siting, delivery and community questions.

POWER

Grid connections, substations and lines.

WATER

Supply, treatment and cooling.

PUBLIC WORKS

Roads, pipes and public spaces.

THE END

THE CLOUD IS STEEL, WATER, WIRE AND PEOPLE.

Next time: more from the Infrastructure Guard.

GOTB CONSULTING · CHICAGO

Data centers · Power · Water · Public works

AI-generated art, fictional characters