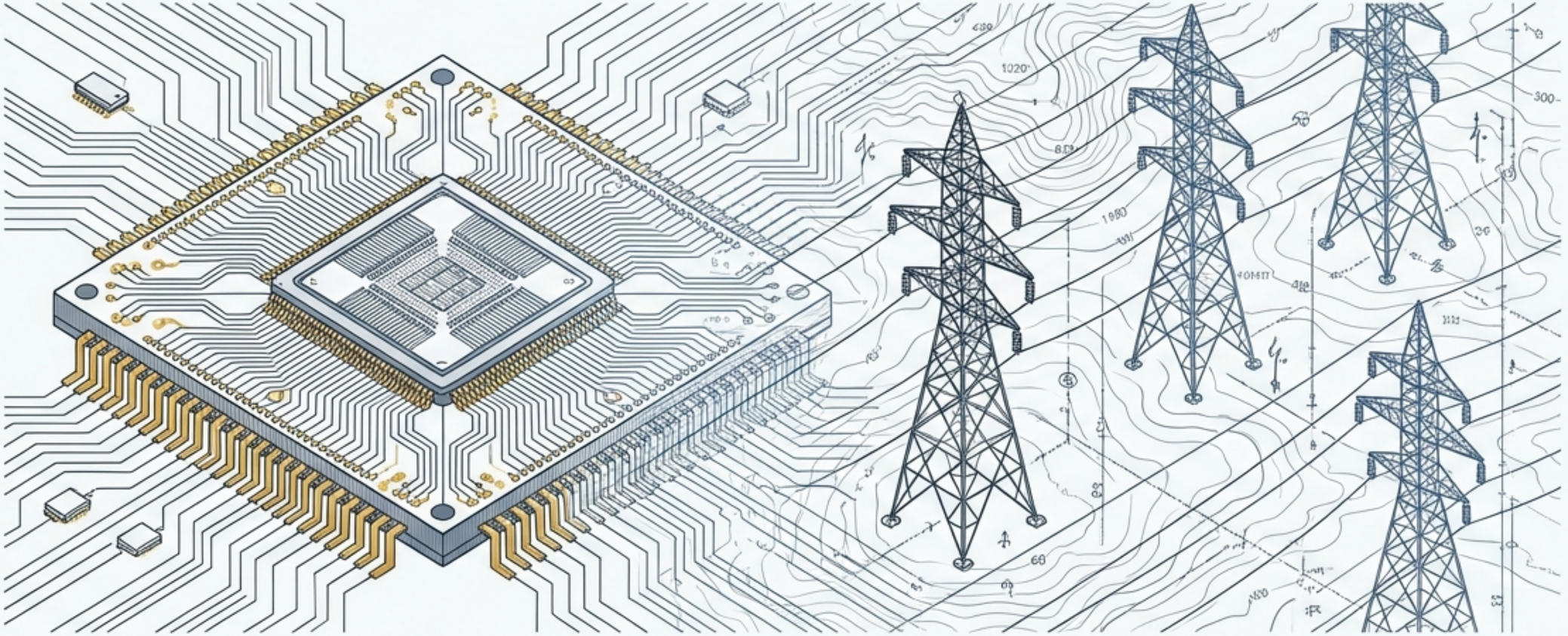
The Power & Density Pivot: U.S. Data Center Market Outlook (2025–2030)

From cloud-scale connectivity to the physics of AI infrastructure.



Comprehensive Strategic Analysis • Market Data 2024–2025

Unprecedented demand is colliding with critical infrastructure bottlenecks.

The Boom

Record-Breaking Absorption.

Total capacity in primary markets reached **6.9 GW** (+34% YoY). Construction pipelines have **doubled** to **6.35 GW**, driven by hyperscale expansion.

The Shift

Geography is Fluid.

For the first time, **Atlanta (706 MW)** outpaced Northern Virginia **(452 MW)** in net absorption. **Power availability** now dictates location strategy.

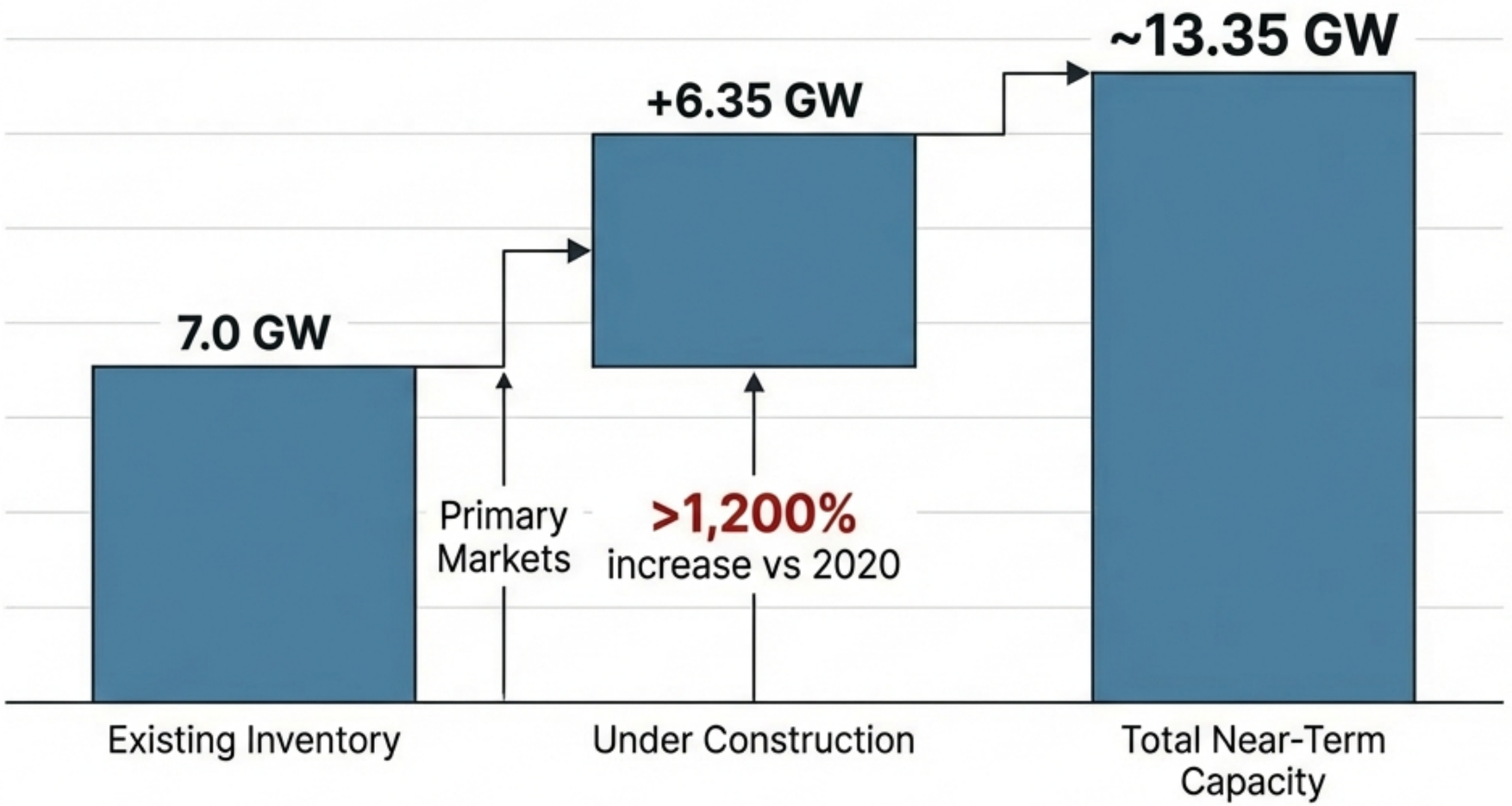
The Constraint

The Grid Governor.

Vacancy is **<1.9%**, but power delivery timelines have stretched to **4+ years in key hubs**. The market is no longer demand-constrained; it is **time-to-power constrained**.

The U.S. remains the global epicenter of digital infrastructure with a $100B+ valuation.

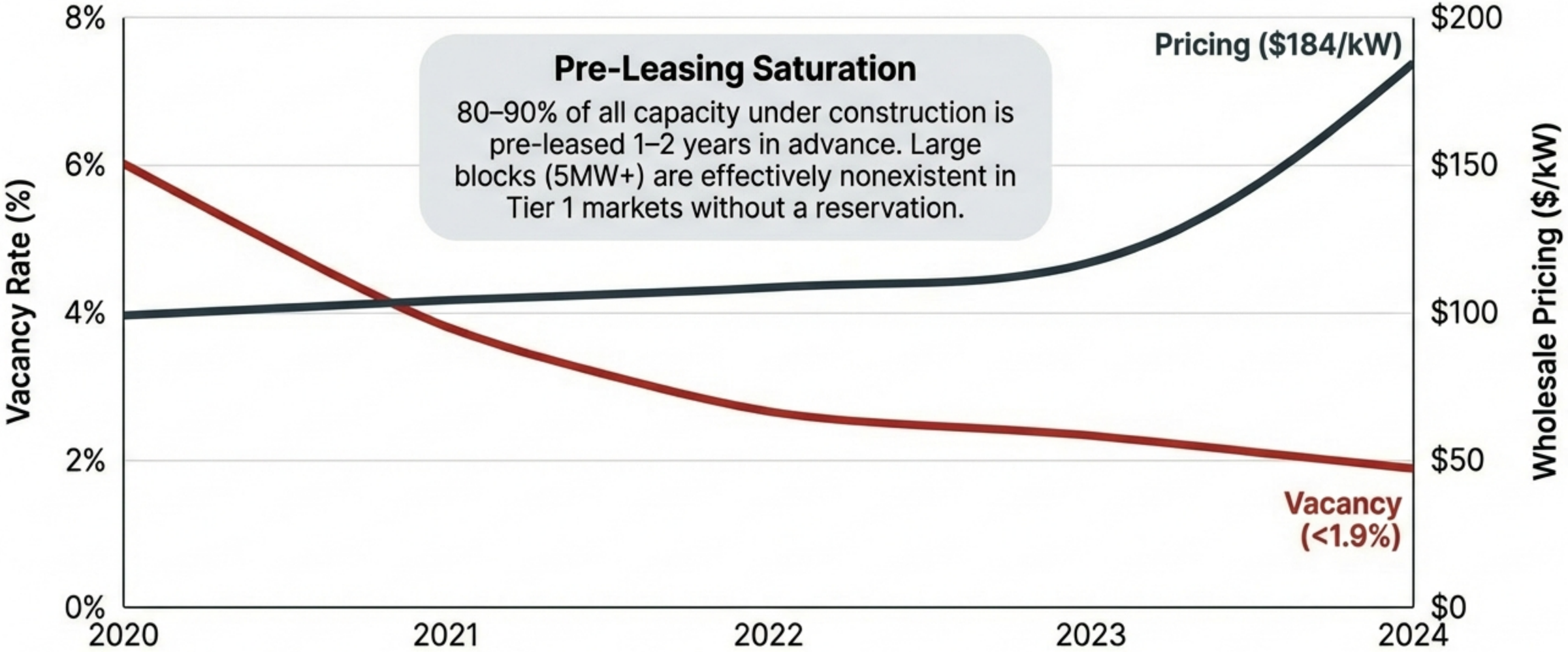
U.S. Digital Infrastructure Capacity & Growth.



Market Baseline (2024)

- **Valuation:** **$70B–$115B** (Estimated Market Value)
- **Scale:** Northern Virginia alone hosts **30 million sq. ft.** of space (Equiv. to 520 NFL fields).
- **Global Share:** North America accounts for **~50%** of worldwide capacity.

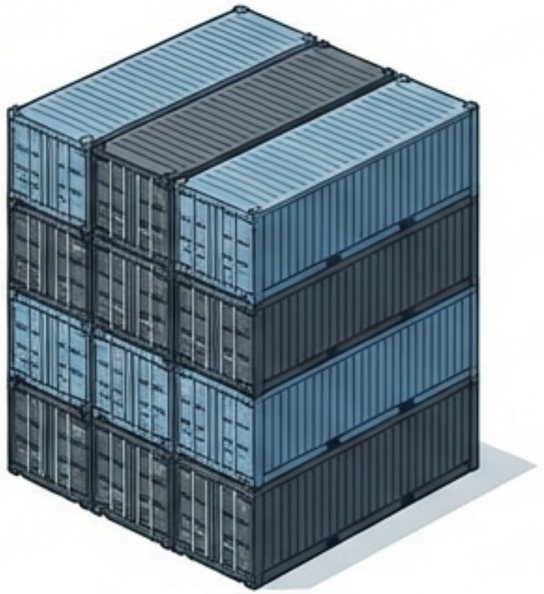
Availability has evaporated, driving rental rates to record highs.



Hillsboro, OR saw a 46% YoY rent increase due to local supply crunch.

The last decade was defined by Cloud Scale; the next will be defined by AI Density.

The Hyperscale Era (2015–2024)



- **Drivers:** Enterprise Cloud, Streaming, Mobile.
- **Net Absorption:** 330 MW (2020) → 1,800 MW (2024).
- **Metric:** Connection & Storage.

Facility physics are changing from "More Data" to "Hotter Data".

The AI Pivot (2025–2030)

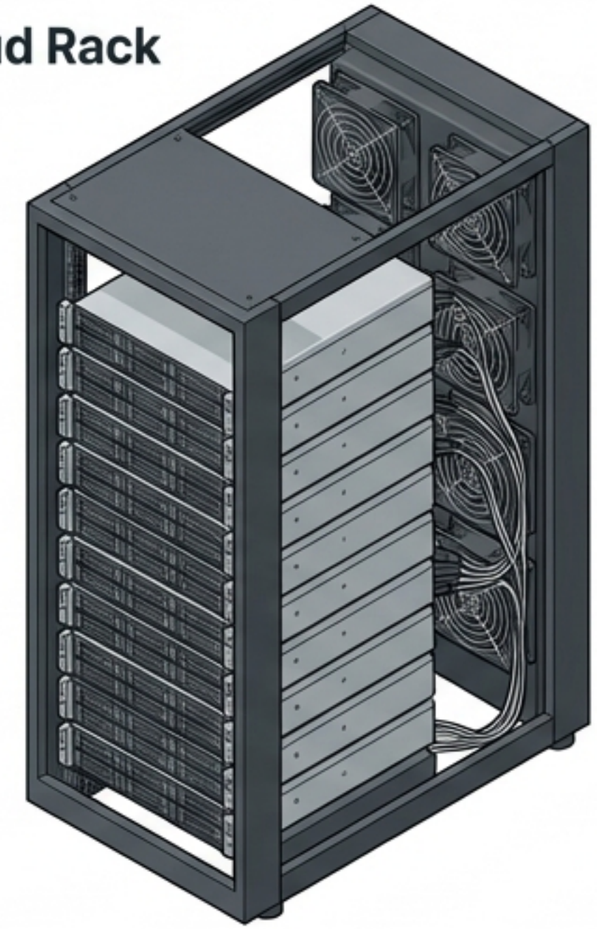
- **Drivers:** Generative AI, Large Language Models.
- **Workload Shift:** AI moves from 20% to ~50% share.
- **Metric:** Power Density & Heat.

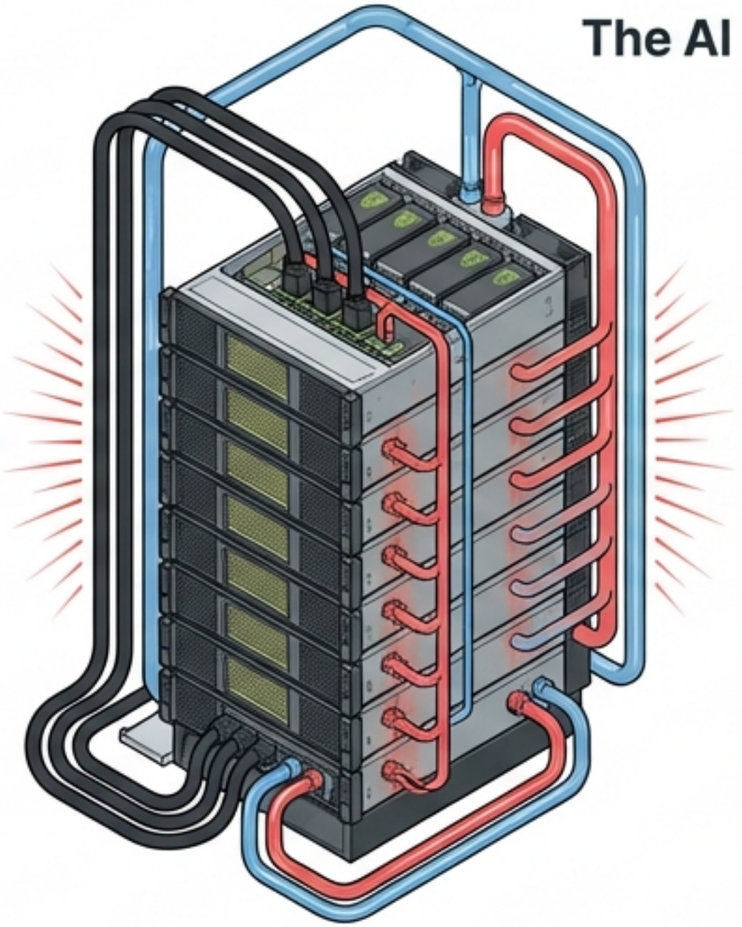
2015 2020 2024 2025 2030

AI hardware is altering the fundamental physics of the facility.

The Standard Cloud Rack

- **Power:** 6–12 kW
- **Cooling:** Air Cooled (CRAC/CRAH)
- **Use Case:** General Compute



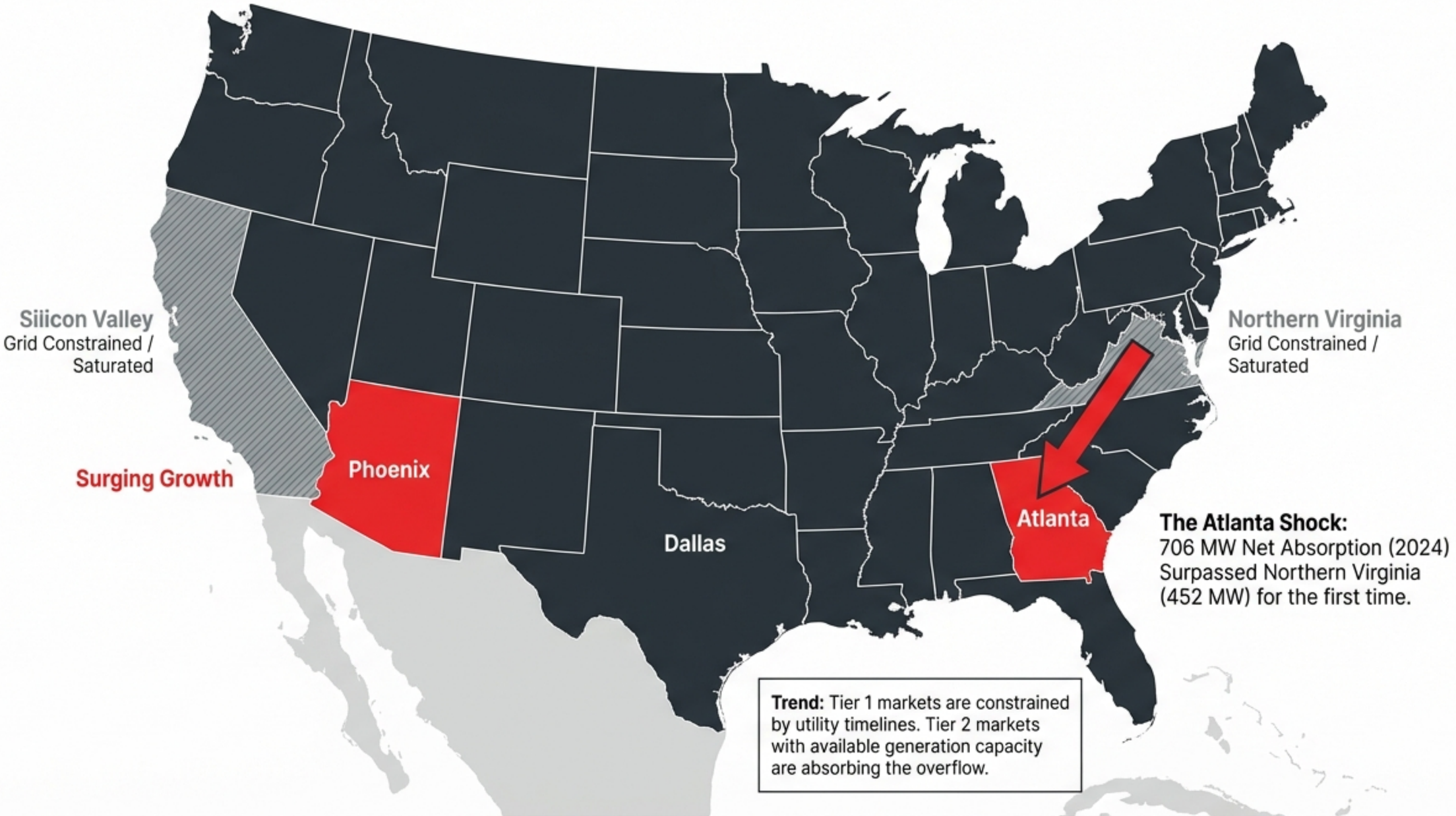


The AI Training Cluster

- **Power:** 40–100 kW (NVIDIA H100s)
- **Cooling:** Liquid / Direct-to-Chip
- **Use Case:** Model Training

Financial Impact: AI-ready infrastructure costs are rising to **$20M–$30M per megawatt** due to electrical upgrades and cooling requirements. JLL projects 80% of new builds will require liquid cooling.

Power availability is overthrowing the traditional hierarchy of data center hubs.



Secondary markets are rapidly evolving into primary hyperscale targets.

Phoenix, AZ

+67%
Inventory Growth

Key Driver:
Low Power Cost vs. California

Constraint:
Water Scarcity
(Driving waterless cooling)

Hillsboro, OR

46%
Rent Growth

Key Driver:
Connectivity
Gateway to Asia

Status:
The new West Coast alternative

Emerging Frontiers (IN & LA)

Tax & Power Incentives

Key Driver:
Speed to Power

Insight:
Indiana and N. Louisiana selected for grid capacity, not population density.

Site selection criteria have shifted from ‘Network Latency’ to ‘**Speed to Power**’. Sites with 18–24 month utility timelines win regardless of location.

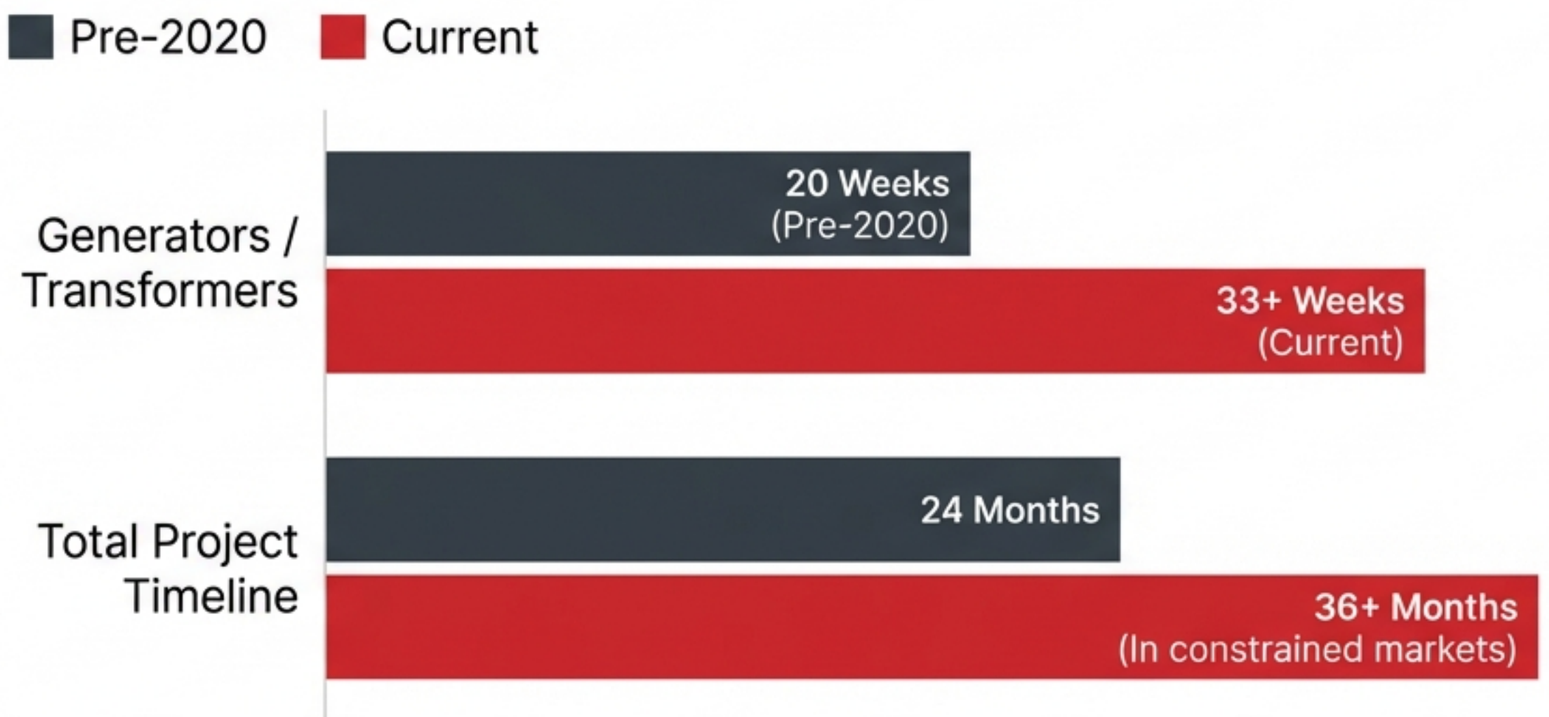
The Grid is the Governor: A critical timeline mismatch threatens growth velocity.

The Timeline Gap

- Data centers projected to consume 6–12% of total U.S. electricity by 2028.
- **NERC Warning:** Rapid load growth threatens grid reliability.
- **Reality:** Record capacity is under construction, but significant portions sit idle waiting for “will serve” dates.

Supply chain friction is elongating project schedules by nearly 50%

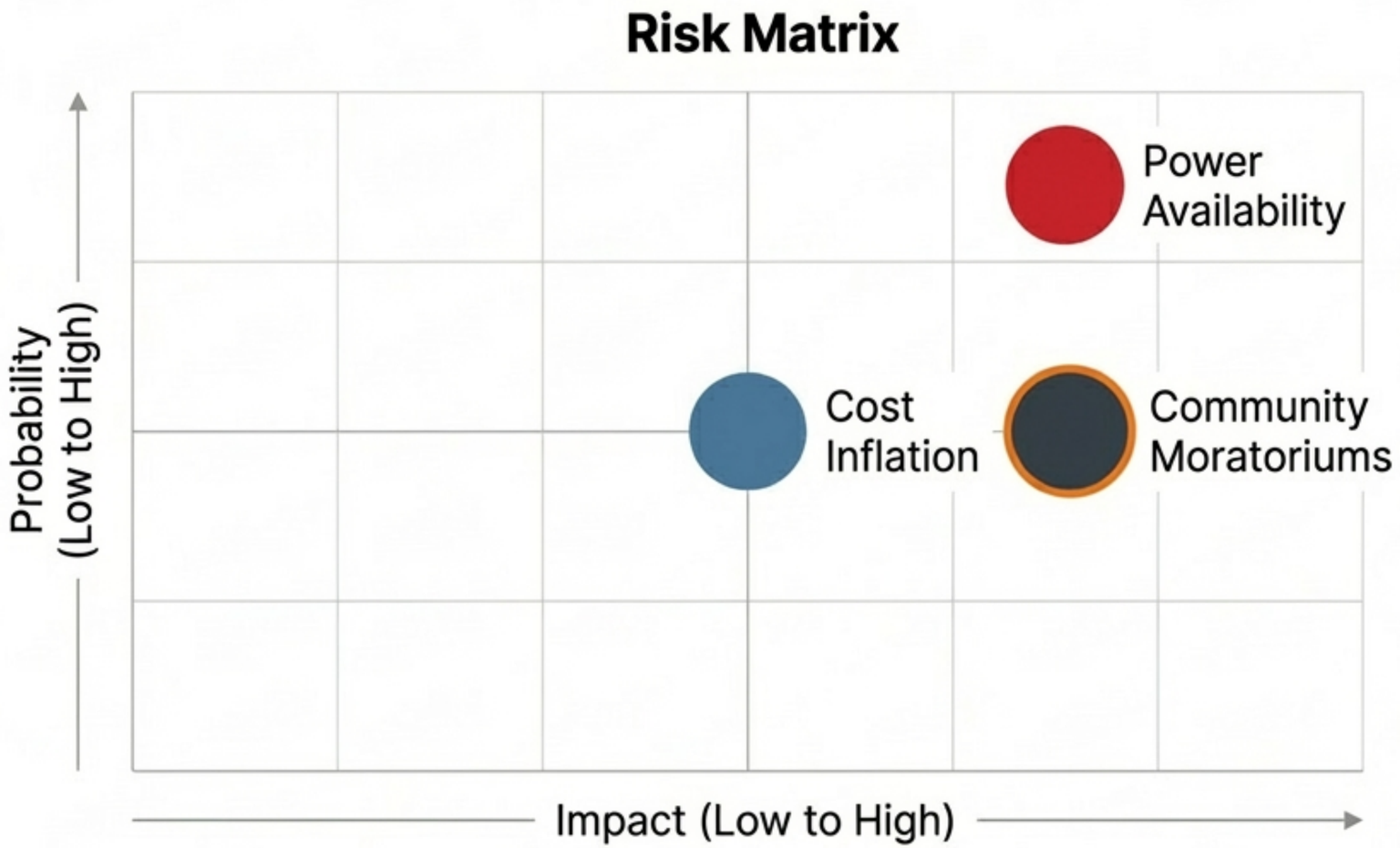
Lead Time Comparison



Operators are adapting by **stockpiling** equipment (6–12 months inventory) and entering "**shared risk**" co-investment deals with manufacturers.

The industry is effectively Time-to-Power constrained, not capital constrained.

Regulatory friction and community pushback pose rising threats to development.

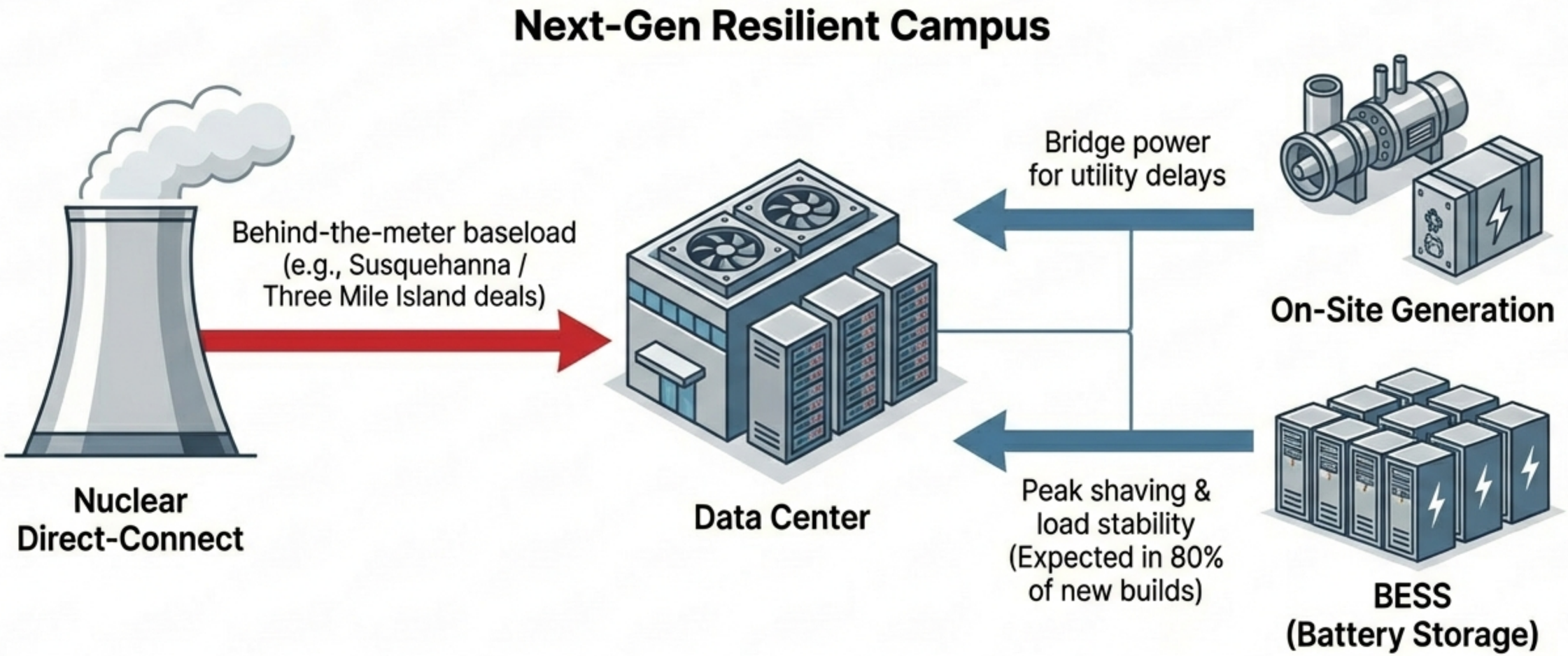


The “Good Neighbor” Problem:

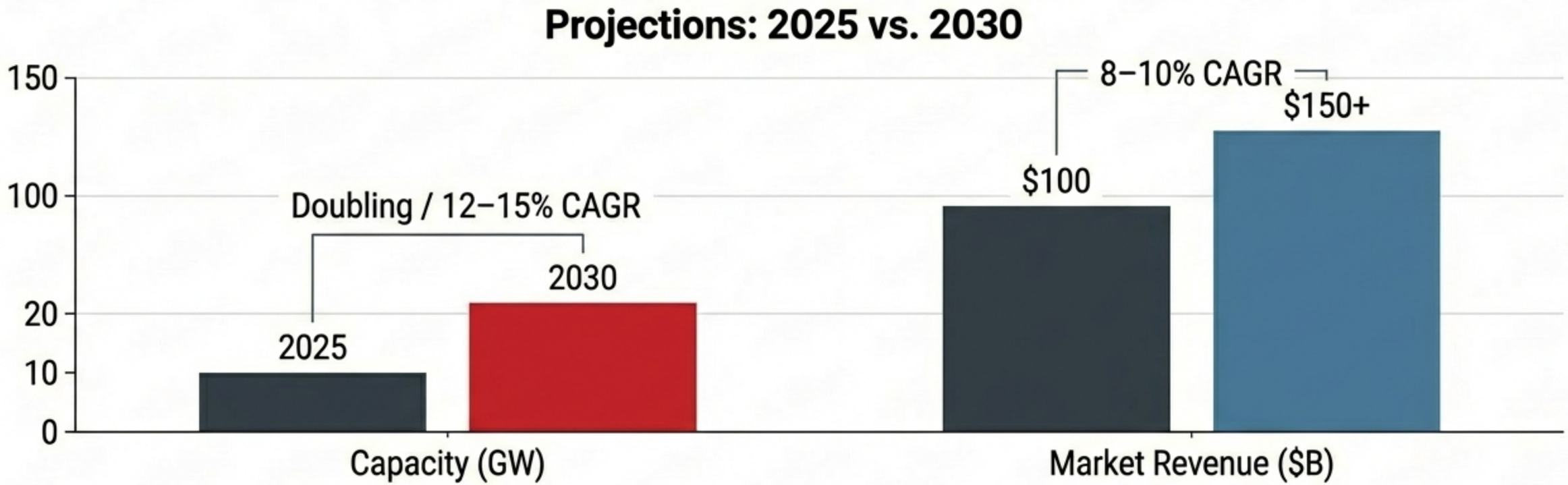
16+ projects worth $64B have been delayed by local opposition.

Issues: Noise ordinances (NoVa), Water usage (West), and “Energy Hog” perceptions increasing utility bills for residents.

Operators are bypassing the grid with on-site generation and nuclear partnerships.



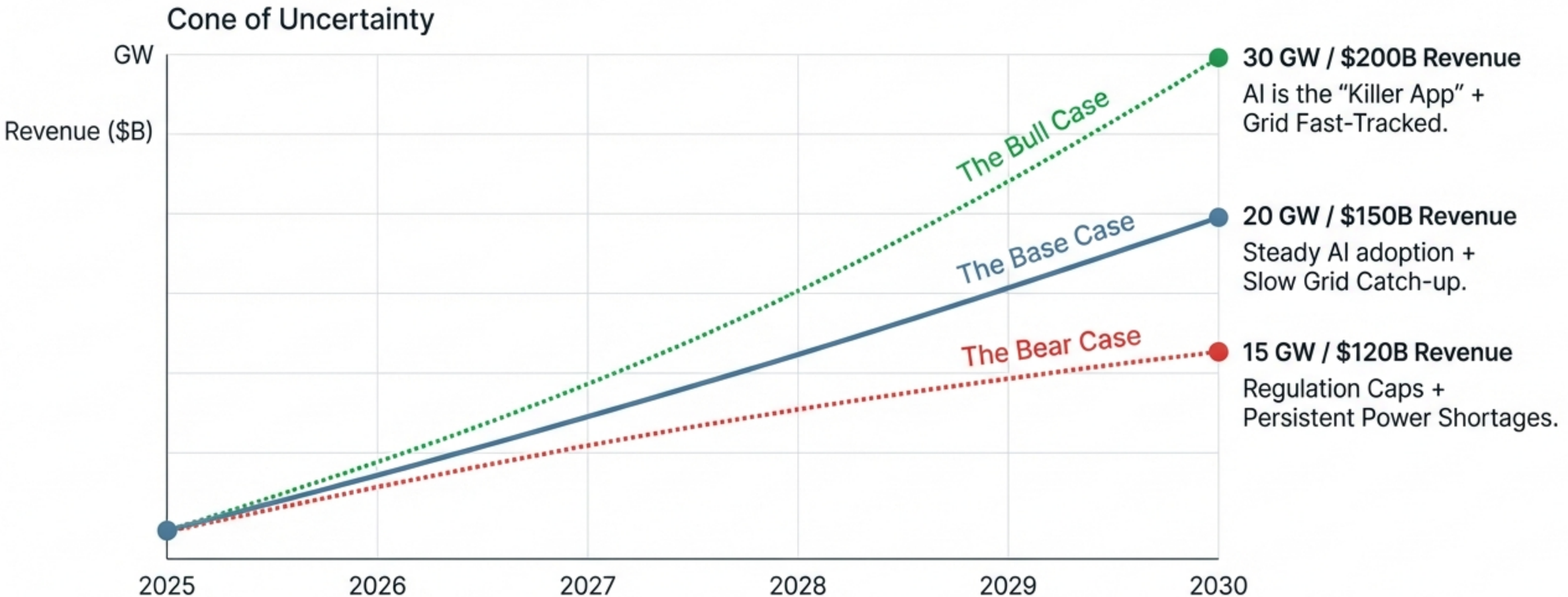
The Base Case: Capacity doubles by 2030, driven by the AI integration.



Key Assumptions:

1. AI workloads reach 50% of total demand.
2. Grid upgrades catch up slowly (NoVa relief by 2026/27).
3. Utilization remains high; vacancy stays low single-digits.

Market trajectory hinges on two variables: AI adoption speed and Grid flexibility.



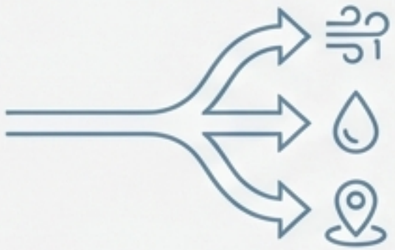
Even the downside scenario represents growth; the digital trend is secular, but the slope is determined by infrastructure policy.

Navigating the Power Pivot: Strategic Imperatives for 2030

1

Power Dictates Strategy

Sourcing gigawatts is now more complex than sourcing silicon. Site selection is an energy problem, not a real estate problem.



2

Flexibility is Survival

Success requires technical flexibility (liquid cooling readiness) and geographic flexibility (willingness to leave Tier 1 hubs for Tier 2 power availability).

3

Efficiency as a License to Operate

Sustainability is no longer PR; it is a regulatory requirement to avoid moratoriums and community rejection.

The U.S. data center sector is the backbone of the 21st-century economy, but the easy growth is over. The next phase requires engineering resilience.