Re-electrification of the U.S.: Forecasting the Impact of Data Center Work

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As the storage of human knowledge shifts from physical media to data, a significant phase of *re-electrification* — recognizing the rising demand for reliable, high-quality power across sectors — is emerging. This article defines re-electrification and explores industry trends, leading indicators, and expected impacts on construction and beyond.

THE CONCEPT OF RE-ELECTRIFICATION

There was a span of 68 years between when Thomas Edison opened the first power station in New York City and when most American farms obtained electricity.[1]

Bringing electricity to homes and industries required support from many people and industries over the course of a century; for construction specifically, it required companies to build the infrastructure. The results were incredible, allowing humans to produce more and live comfortably and safely. And the economy boomed because of it.

Today, similar century-spanning work is taking place—the data centers that house tremendous amounts of data are the birthplace of AI. In this article, re-electrification, as coined by Dr. Perry Daneshgari, describes the next demand shock on the power system and the construction ecosystem that builds it. For construction financial leaders, this means larger, faster projects with new cost centers (power quality, interconnects, advanced cooling), tighter labor markets, and owner schedules that compress cash cycles and heighten risk.

The growth of low-voltage and technology markets and now the data center market in construction are early indicators of expanded capacity for data storage, movement, and usage. This expansion could have the same impact as the first electrification, changing needs for physical and human resources to support the data industry.

THE DATA CENTER MARKET

The U.S. Census Bureau measures each standalone category of construction with a significant amount of construction put in place.[2]

In 2024, data center new construction starts (by permit value) reflected more than $9 billion by June (Exhibit 1), with projections to finish 2025 at $24 billion.[3] The total private construction market size was approximately $1.7 trillion in 2024,[4] making data center work 5.3% of the U.S. construction market.

The U.S. data center construction market is expected to grow at a rate of 10% per year through 2030[5] and holds the largest share of the global data center construction market, which was reported at $241 billion in 2024.[6] This hyperscale growth requires significant construction resources for data centers specifically but also for the demand on the country's power infrastructure.

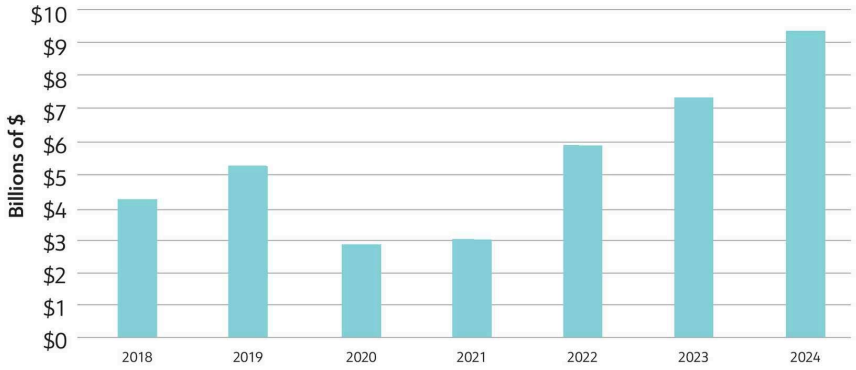
Exhibit 2 shows the current value and expanding size of the electrical construction market using a method for measuring economic market size in construction, developed by MCA, Inc.[7] In 2018, electrical construction reached $100 billion for the first time and grew to $150 billion through 2023.

In terms of contract value, data center projects often land in the $100 million-plus range. The demand to build that volume on compressed schedules is resulting in avoidable rework and overtime with the current means of project delivery.

Many contractors report premium margins on hyperscale work—but schedule compression and rework risk can quickly erode those premiums.[8] Additionally, labor shortages are being used to justify these premium margins.

The continuance of this market size and scale will require a new ecosystem for construction and likely a disruption.[9] For example, when demand skyrocketed 100 years ago in the manufacturing industry, the exact opposite effect happened to the power plant market: as capacity and capability improved with technology, it effectively reduced the overall size of the market and the work necessary to provide the same amount of capacity. A similar trajectory is plausible in data centers: as server efficiency, power density, and cooling improve (e.g., liquid/direct-to-chip), usable

Exhibit 1: Data Center Construction Starts Year-to-Date Through June



capacity per square foot rises and owners may adjust phasing — changing how contractors plan labor and cash.

Exhibit 3 compares the power plant infrastructure with its capacity, showing a 10-year shift in available capacity from new plants.[10] A similar trend could happen in the data center market.

KEY LESSONS FROM THE FIRST ELECTRIFICATION

Looking back at the electrification of the U.S. beginning in the 1880s through the 1950s, similar patterns emerge between the proliferation of electricity and the proliferation of data.

Key events in the first electrification included combined efforts of inventors, scientists, engineers, manufacturers, and regulatory agencies, most significantly President Franklin D. Roosevelt's New Deal, which included legislation to regulate public utilities to bring power across the country.[11]

Once electricity was available, its unknowns (similar to the unknowns with AI today) needed to be overcome with practical examples and training. Consumers needed to understand how using electricity would benefit the activities of daily life both at home and at work, and that the craftsmanship to bring power and light to homes, farms, and businesses also required new training and regulations so everyone could use it safely.

Similar to what happened in the 1950s with power and light, the U.S. needs a workforce to build, operate, and maintain the infrastructure of data centers and beyond to support AI. Just like in the 1950s, the federal government is now supporting and putting policy in place to accelerate this shift, for example, the AI action plan.[12]

As a result of the first electrification in the U.S., electric power generation went from 5% of electricity production to 30%, offsetting sources such as coal and gas. Eventually, the cost of electricity fell from $1.60/kWh to less than $0.10/kWh, but the human benefit continued to expand.[13]

This will likely happen with data management as well, and construction will be seen as a key area to reduce costs.

IMPACTS & PREDICTIONS

While data expansion has been happening for several decades now, the pace of this re-electrification is unprecedented. The impacts on citizens and consumers, the construction industry, and the overall economy will be long-lasting.

For consumers, similar to the first electrification, the cost and accessibility of data will improve. Just like other industries that expanded to support mass consumption at reduced cost, the data infrastructure will follow the same pattern.

For example, during the second half of the 20th century, manufacturing reduced its footprint needed for the same amount of production by 75%[14] through industrialization by applying principles of lean and just-in-time manufacturing inventory. This changed the ecosystem of the entire supply chain, reducing the cost of goods and expanding their availability.

Business Model

For construction providers and their supporting structures, the business model must shift to match the demands of re-electrification.[15] The current models assume high levels of labor availability and predictability which no longer exist — and the construction supply chain is not completely set up yet to support it.[16]

Competitiveness and cost reduction will require the models put in place to be tight, integrated, and efficient. Existing work structures — and the current market for trained labor — will not be able to fully support the data center boom under the current pricing requirements of the so-called labor shortage.[17]

Large Projects

Larger projects will also continue, and few contractors are set up to deliver them; success will rely on data-driven project management.[18]

THE DATA CENTERS that house tremendous amounts of data are **THE BIRTHPLACE OF AI.**

In studies of contractor data and behaviors, large projects tend to succeed because companies put the best crew on them, rather than having a system set up to run one or multiple $50 million-plus projects.

Just 10 years ago, a $50 million project for a trade contractor (or $100 million for a GC or construction manager) was considered large. Now these projects are becoming mainstream, with several of them in the pipeline and backlog. Exhibit 4 shows a sample of how these projects have grown over the years.

Larger projects are exciting to win, but difficult to manage with the same processes. It's like running a full business, requiring financial, contract, and resource management — and it starts with a visible pipeline and backlog that link to the management of the work.

However, all of this project overhead also needs to translate into lower labor cost, not just through reducing paperwork but by understanding the work and helping to plan and reduce that cost.

MCA, Inc.'s data also shows that these larger projects exhibit a higher rate of data quality issues, often attributed to the perceived difficulty of applying standard processes on complex, large-scale jobs.

Economy

Re-electrification's impact on the economy will include short-term surges in local demand for inputs during construction and in outputs once facilities are online. Primarily driven by private funding, data centers will bring local business activity and jobs during and after their development.

The data expansion will also shift value and expand support needs nationally and globally. A similar pattern occurred in the first electrification, both before and after deregulation. In addition to the data center physical locations, the maintenance projects that will be required to sustain the infrastructure will grow.

CONCLUSION

Re-electrification is no longer abstract; the data center buildout is accelerating demand for power and construction capacity, compressing schedules, and exposing the limits of today's delivery models.

Exhibit 2: U.S. Total Electrical Construction Market Size