Energy Will Decide the AI Race

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MILAN – Data-center investments hint at a coming shift in the AI race. Soon, if not already, reliable, affordable electricity will confer the decisive advantage in the sector.

As Albert O. Hirschman argued in *National Power and the Structure of Foreign Trade*, an economy's true power lies in its ability to manage the choke points that affect its industries. In the AI ecosystem, the United States has been leveraging its dominance in chip design by strategically limiting exports to China, while China has exerted pressure on the US through its control of rare-earth materials needed to manufacture chips, magnets, and other components of advanced technology.

But as the scale of the AI industry and its reliance on computing power grows, the bottleneck will move from chips to electricity, because all the data centers in the world will not help you if they lack a continuous supply of affordable energy. The International Energy Agency estimates that roughly 20% of planned global data-center capacity will be at risk by 2030, owing to grid bottlenecks and interconnection queues. And as energy supplies are constrained, costs will rise, eventually trickling down to households and

firms.

Which country will dominate this next leg of the race? China has certainly made a statement with its massive build-out of energy supply and distribution infrastructure, much of which focuses on renewables. According to the *Financial Times*, Chinese investments in clean energy cover everything from solar and hydropower to the hardware needed to move cheaper inland power to coastal demand centers, thus lowering costs and improving reliability. China has also invested massively in manufacturing, driving down the price of a solar panel by a factor of 20. All told, it is now capable of adding between 500 gigawatts and one terawatt of capacity per year.

Moreover, China has matched its carefully planned industrial policy with equally strong local execution. To offset the higher cost of using domestic chips, for example, local governments offer electricity subsidies for data centers under their jurisdiction. If these facilities are powered by domestic chips, they can cut their power bill by as much as 50%.

The US effort is rather unimpressive by comparison. According to the *Financial Times*, "China installed 429 GW of new power generation capacity in 2024, more than six times the net capacity added in the US during that time." Even as America's locally planned grids face enormous around-the-clock demand from data centers, US industrial policy is failing to give electricity the attention it deserves.

For example, OpenAI and its partners are planning to build data centers that will require ten GW of capacity, which is on the order of New York City's summer peak load electricity usage. But, while data centers can be built in a couple of years, researchers at the Deloitte Research Center for Energy & Industrials point out that completing the transmission infrastructure needed to move energy takes almost a decade.

Such time frames are woefully misaligned with the blistering pace of private capital expenditure. A Bloomberg analysis of tens of thousands of pricing nodes already shows signs of distress in US energy markets. Wholesale electricity in some US regions near large data-center hubs is up to 267% more expensive than it was five years ago. To keep its projected data-center build-out on track, the US will need a structural overhaul of its energy policy, its grids, and their interconnections.

Nor is the race down to just the US and China. The bottleneck that could set America back might represent an opportunity for Europe, which is running out of time to claim its own seat at the AI table. Europe's energy infrastructure is a potential strategic asset in the sense that Hirschman identified. Among the European Union's core strengths are clean energy hardware and know-how. More than one-fifth of all clean and sustainable technologies worldwide are developed in the EU. The bloc also has deep engineering capacity in grid equipment and storage, and its electricity system is among the most interconnected in the world. Europe's energy policy explicitly cites grids as a strategic asset for autonomy and security, and European factories making strategic net-zero technologies are to meet "at least 40% of [the EU's] annual deployment needs by 2030."

That said, European decarbonization has run into its own share of obstacles. With high energy costs threatening to hinder growth, energy generation and grid capacity must be ramped up. The European Network of Transmission Systems Operators for Electricity has advanced a useful proposal. But while the planning is carried out at the European level, the execution remains locally bound. As a result, the average grid project takes more than ten years to complete, half of which is spent on permitting. According to the European Parliamentary Research Service, current projected grid investments are a mere 10-15% of what's required, and more than 500 GW of offshore projects in the EU – capacity still waiting for grid connection assessment – is stuck in

the queue.

The next leg of the race will be about energy. By fostering domestic chip production and consumption while improving electricity infrastructure, China's strategy addresses every dimension that matters. Meanwhile, the US is failing to look ahead, complacent in its current position as the designer of first-in-class chips and AI foundation models. And though Europe is uniquely positioned to make AI's energy demand cleaner and more secure, it may lack the institutions needed to accelerate progress. For Europe to be a challenger, it, too, must direct its energies toward energy.