REDWOOD GROVE CAPITAL

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Data Centers, Electricity, and Climate

Many people know of the Svalbard Global Seed Vault in Norway, but fewer know that within the same mountain lies the Arctic World Archive—a physical vault preserving humanity's source code. Engineers transformed a former coal mine into a steel-reinforced, offline data center designed to endure up to a millennia. Alongside cultural artifacts, this vault holds 21 terabytes of open-source code, including Linux and Android—the essential DNA of our digital civilization.

In earlier letters, we referred to data as "the new oil" due to its integral role in powering our economy. In retrospect, that may have been an understatement. Unlike oil, data has become a store of fundamental knowledge, pari passu with seeds and cultural artifacts deemed vital for rebooting society in an apocalypse.

This year, AI enthusiasm and data center expansion have acted as engines for the equity market. Yet few people have ever stepped inside one. These facilities are among the most secure and regulated spaces on earth—sterile, humming with thousands of fans, bathed in blue light, and managed by only a handful of engineers. The term "cloud" belies their physicality: these are massive industrial structures consuming enormous quantities of water and power. A large data center can use as much water as a town of 30,000 people. Based on self-reporting to the Carbon Disclosure Project, Google, Amazon, and Microsoft collectively consume roughly 100 terawatt-hours of electricity annually. This electricity consumption is comparable to the Netherlands, but unlike the nation state the tech companies electricity demand doubles every few years.

As demand grows, data centers are increasingly understood in ecological terms: industrial organisms that inhale cold air and exhale heat. In Scandinavia, some data centers channel their waste heat to warm nearby homes. Increasingly data centers are located based on their access to energy. Switch's Citadel Campus data center, once the largest in the world, is in the Nevada desert because of the ability to access solar power. Designing them with resource efficiency in mind will be essential as AI workloads expand.

This year Redwood Grove positioned it portfolio to benefit from the energy demands of data-center growth. We seek exposure to such structural trends while maintaining discipline on valuation and climate impact. The convergence of those forces has supported performance this year.

Renewable stocks sold off sharply amid regulatory fears surrounding the administration's energy policy. We judged much of that risk to be fully priced in by early 2025 and added selectively to high-quality names. Renewable-equipment manufacturers were trading at 60–70% discounts to historical valuations—levels we viewed as inconsistent with long-term fundamentals. Growing electricity demand in the United States needs to be met. Natural gas turbines are supply constrained, unable to scale up manufacturing in the next few years. Small nuclear module reactors' timeline is even further off from being a source of new electricity, likely not able to scale until the mid-2030s.

As the "Big Beautiful Bill" moved through Congress, our team engaged with industry leaders and policymakers—working to preserve key utility-scale solar tax incentives through mid-2026. Crucially, the legislation allows developers to "safe harbor" projects initiated before mid-2026, enabling them to utilize current tax incentives for up to four years thereafter. This provision effectively extends the IRA's impact, and some estimate that as many as three years of projects have already qualified. In addition, should interest rates ease or a more favorable regulatory environment return, renewables economic advantage may expand even more rapidly. While permitting delays remain a headwind, policymakers

of both parties are increasingly sensitive to rising electricity prices and are focused on reducing these delays to ease inflation pressures.

Renewables, despite the political rhetoric, remain the cheapest and fastest to deploy and are well positioned to fill the demand. We leaned into those dislocations in the first half of the year, adding selectively to both pure-play solar names (Array, Shoals, First Solar) and adjacent companies such as Ameresco (energy-efficiency and microgrid projects) and Generac (standby-generation and storage solutions for data-center reliability).

Closing Thoughts

The World Meteorological Organization recently reported that atmospheric CO_2 concentrations hit a record high in 2023–24, rising by 3.5 ppm in a single year—the largest annual increase since measurements began in 1957. Feedback loops contributed to this jump in emissions. Australia's tropical rainforests, once robust carbon sinks, have turned into net emitters as higher temperatures and drought stress increases tree mortality.

This interconnectivity and climate complexity continues to surprise us: a recent paper in *Communications Earth & Environment* found that ammonia from penguin guano can seed aerosol clouds that locally cool parts of Antarctica, modestly slowing ice melt. We mention these unlikely connections as a reminder that small forces can shape large systems. If penguins can contribute to planetary cooling, we too should act—through innovation, investment, and stewardship.

At Redwood Grove, our strategy is built around climate mitigation and resilience. We may not be the largest asset manager, but we believe our capital—and our clients'—can drive measurable impact alongside competitive returns. **Be like the penguin!**

Thank you for your continued trust and partnership. Please don't hesitate to reach out if you would like to discuss the portfolio or our outlook in more detail.

With gratitude,

The Redwood Grove Capital Team

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