Macquarie Global Listed Infrastructure[1]

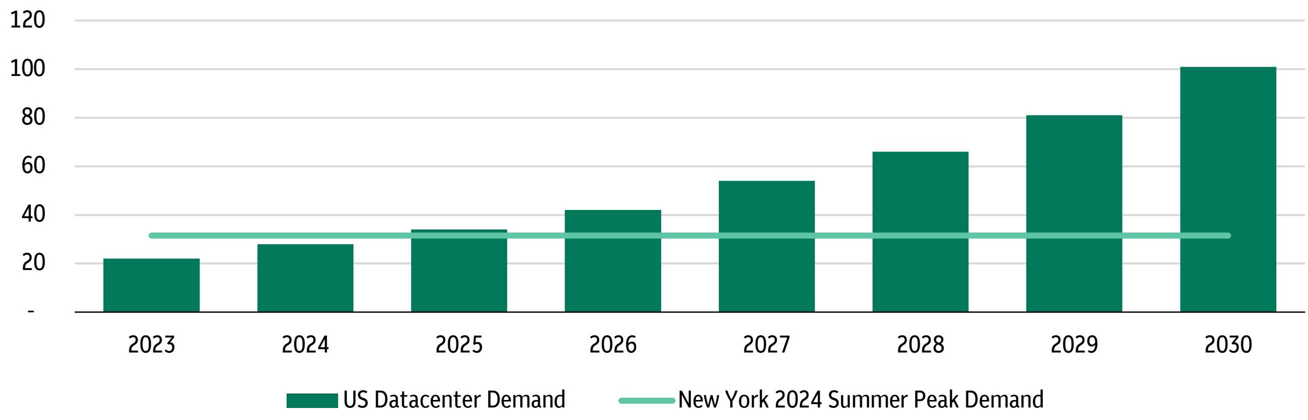
DeepSeek or no DeepSeek. Trump or no Trump. US power demand is surging.

The beauty of renewables? It can be summed up with the slogan of a well-known battery company in the 1970s: No regular battery looks like it…or lasts like it.

Power is coming

Most up-to-date estimates from McKinsey & Co. suggest power demand from datacentres will quadruple in the US by the end of the decade to 80-100 gigawatts (GW)*. To get a sense of how much power that is – the entire New York State's peak power demand was just 32 GW this past summer*.

Electricity Demand (GW)



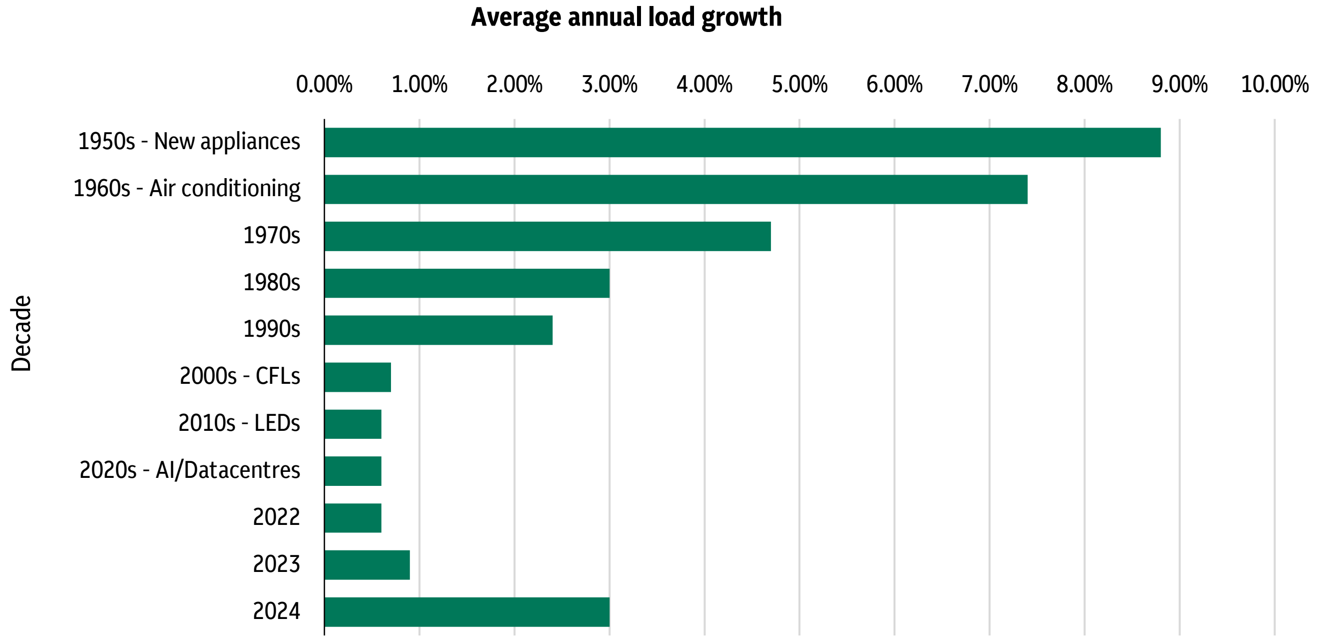
*Sources: McKinsey (Jan 2025), NYISO Summer Forecast (2024).

[1] Macquarie Global Listed Infrastructure is an equity team within Macquarie Asset Management's (MAM's) Equities & Multi-Asset business.

The surge doesn't stop there. Expect more demand from these three themes:

1. Reshoring of energy-intensive manufacturing sectors like semiconductors
2. Electric vehicles
3. Broader electrification

Power demand in the next 10 years is expected to be vastly different from the last 20, which saw close to 0% annual growth. Realistically, we believe power demand may be growing close to 2.5-3% compound annual growth going forward.



Source: GridStrategies (Strategic Industries Surging: Driving US Power Demand, Dec 2024). CFL - Compact Fluorescent Lamps, LEDs - Light Emitting Diode

Impact on the grid…

According to GridStrategies, such growth would induce six times the planning and construction of generation and transmission capacities. Plus, datacentres are demanding power to be generated by carbon-free sources, and they want it delivered consistently and immediately.

The question many are asking is whether the US grid is up to the task. It certainly won't be easy.

Today's conventional power grid is powered largely by fossil-fuel-fired generators that run continuously to provide a stable supply of power. Reliable, baseload carbon-free power is scarce and limited to nuclear power.

Potential solution – build more nuclear

Long permitting and construction timelines mean taking 12-15 years to build a new plant. Plus, if history is any indication, nuclear plants are prone to significant cost overruns.

Potential solution: build more natural gas.

That seems to be what the new US administration prefers to do. But a new plant could still take four to five years to reach commercial operations.

Gas turbine availability is tight right now. Macquarie estimates that the two main global suppliers of gas turbine, Siemens and GE Vernova, produce 60% of the world's 220 gas turbines annually and have limited manufacturing capacity. This results in new customers having to pay reservation fees to secure slots in the manufacturing queue.

Below we highlight the expected deployment timelines by generation type.

Generation type	Deployment time
Renewables and storage	Ready now and fast to deploy
Nuclear restarts	2027-2030 (only three across the entire US)
Unplanned natural gas (peaker)	2030+
Unplanned natural gas (combined-cycle glass turbine)	2030+
Small modular reactor	2035+

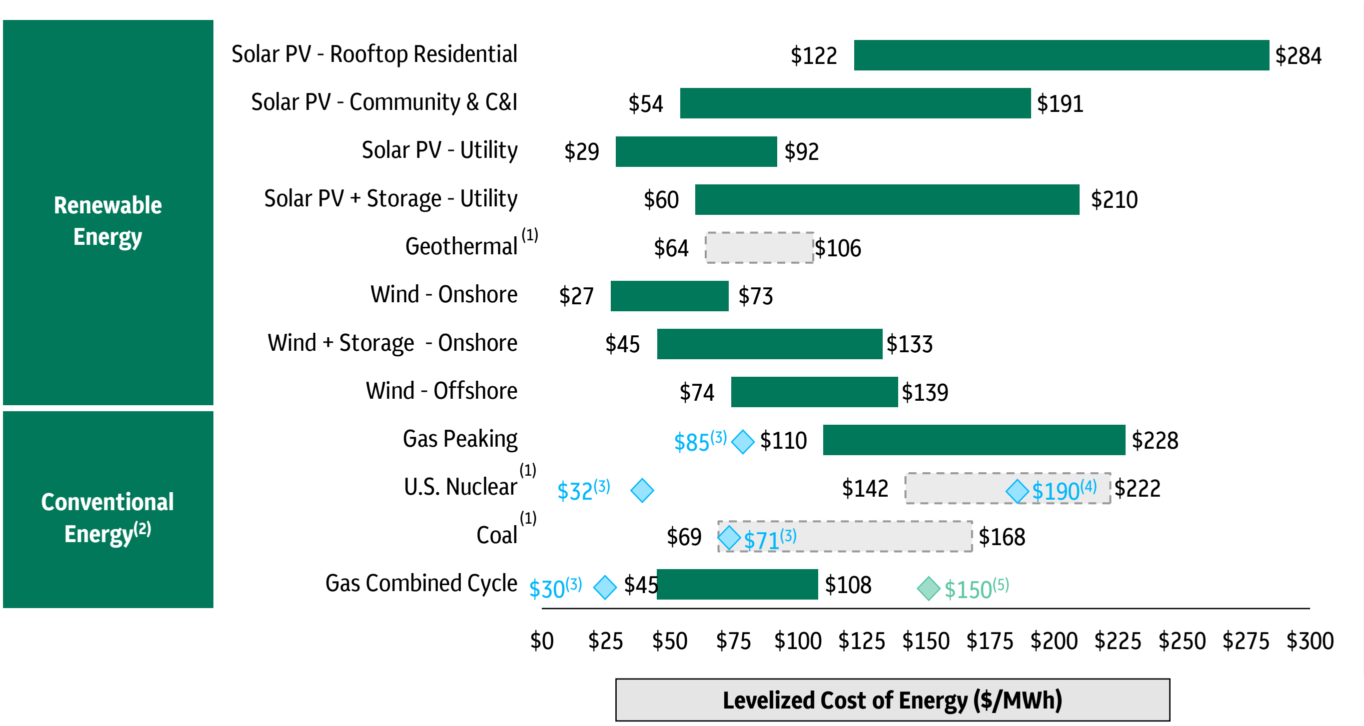
Source: NextEra Energy (Earnings Presentation, 4Q24).

Renewables can fill the void

Renewables have the advantage of being the fastest to deploy. Construction time could be as short as 18 months.

More importantly, renewable projects in resource-rich regions are already cost-competitive with gas power plants on a lifetime cost basis. Renewables also don't face fuel risk or potentially complicated environmental regulations in the long run.

Levelized cost of energy comparison



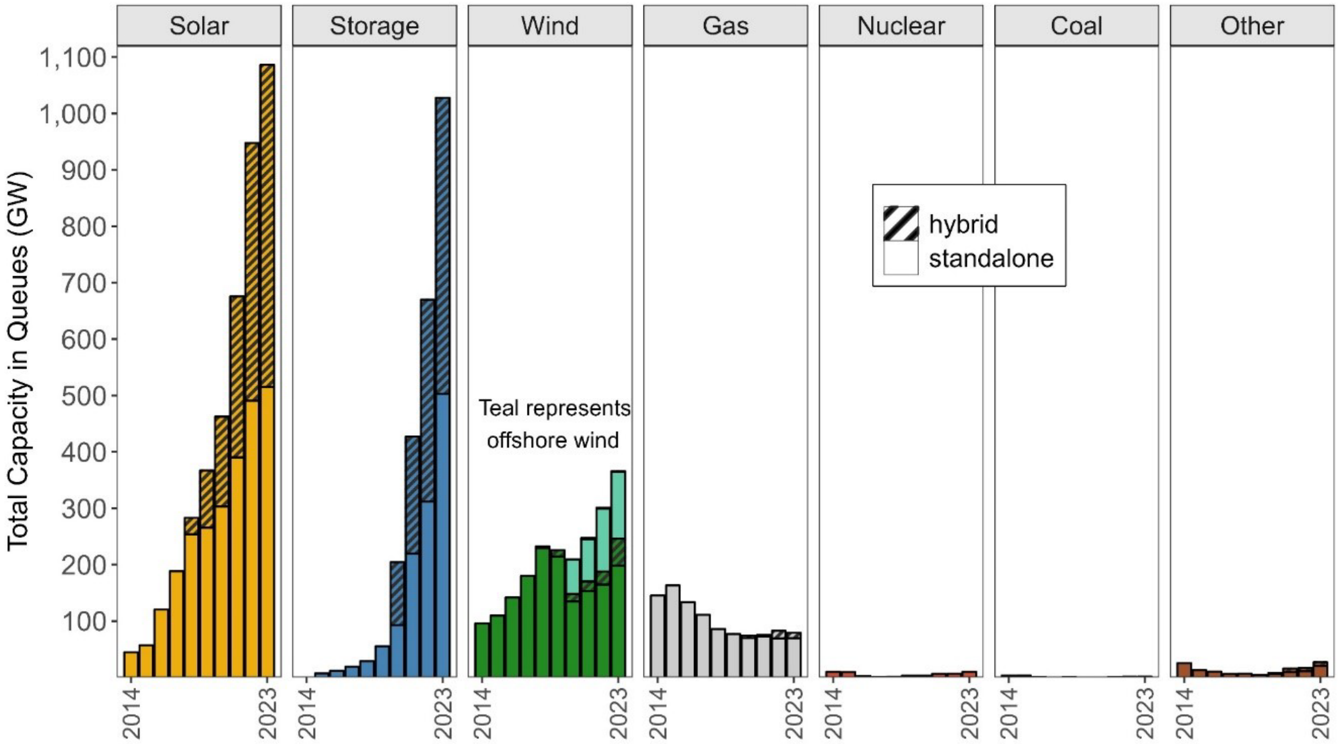
Source: Lazard (LCOE, June 2024)^

New projects are not in short supply, but many are waiting to be connected following a long interconnection queue that requires projects to undergo a series of grid impact studies.

Virtually all new generation project requests, a whopping 1600 GW, are attributable to renewables today. For context, the current installed capacity in the US is just 1250 GW*.

Even if these projects have the same historical rate of success in reaching commercial operations (about one out of four projects), 400 GW is still a massive amount.

Total capacity in US interconnection queues



Source: Berkeley Labs (Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection, 2024)

New opportunities abound for batteries and transmission

It's important not to overlook the fact that an additional 1000 GW of new interconnection requests come from large-scale batteries.

Batteries store excess energy produced by renewables during the day and discharge it during peak hours in the evening, a practice called "load shifting". Batteries will be commonplace in the future grid and require a short lead time of roughly a year.

Demand for new transmission infrastructure will follow the expansion of generation capacity. The Department of Energy estimates intrastate and interstate transmission capacity will grow by 20% and 25%, respectively, leading into 2035. These figures will expand as clean energy growth accelerates.

How is global listed infrastructure exposed?

Our Global Listed Infrastructure Team gain exposure to renewables in two ways. Mainly it resides in integrated utilities that incorporate renewables into their regulated operations. These assets earn a return equal to that of the overall utility rate base.

Second, and to a much smaller exposure in the portfolio today, renewables in contracted generation reside in companies that own and operate portfolios of renewable assets that produce steady and predictable cash flows.

Both exposures are important and likely a growing component of the global listed infrastructure universe and opportunity set.

Conclusion

US power demand is set to surge, driven by data centres, domestic manufacturing and broader electrification. As a result, there is a critical need for more clean and reliable power supply.

Such a significant change presents a new paradigm with a range of potential opportunities. While there are expected to be opportunities across the energy stack (sources of power), renewables are, in our view, essential in this strategy. Utility-scale batteries and transmission infrastructure will also see significant growth to support renewables.

Macquarie's global listed infrastructure portfolio provides exposure to the energy transition through regulated utilities and contracted generation, which we believe are likely key beneficiaries of this major step change in power demand.

Contact us

Visit Macquarie Asset Management to find out more about our range of investments and how our solutions can help you to meet your goals.

Have a question? Please contact us and we will respond as soon as possible.

Key risks

The potential for adverse events in the global infrastructure sector to impact the performance of the investments of the Strategy. Investments in securities issued by companies which are principally engaged in the infrastructure business will subject the Strategy to risks associated with direct investment in infrastructure assets. Factors such as the availability of finance, the cost of such finance in general as well as in comparison to prior periods, the level of supply of suitable infrastructure projects and government regulations relating to infrastructure may influence the value of these investments and hence the Strategy.

The risks of investing in the infrastructure sector include those listed here.

New project risk: Where an infrastructure issuer invests in new infrastructure projects, it is likely to retain some residual risk that the project will not be completed within budget, within the agreed time frame and to the agreed specification.

Strategic asset risk: Infrastructure assets may include strategic assets, that is, assets that have a national or regional profile, and may have monopolistic characteristics. The nature of these assets may generate additional risk given the national/regional profile and/or their irreplaceable nature and may constitute a higher risk target for terrorist acts or political actions.

Documentation risk: Infrastructure assets are often governed by a complex series of legal documents and contracts. As a result, the risk of a dispute over interpretation or enforceability of the documentation may be higher than for other issuers.

Operation risk: Should an infrastructure issuer fail to maintain and operate the assets efficiently, the ability to maintain payments of dividends or interest to shareholders may be impaired. Failure by the infrastructure issuer to carry adequate insurance or to operate the asset appropriately could lead to significant losses and damages.

International investments entail risks including fluctuation in currency values, differences in accounting principles, or economic or political instability. Investing in emerging markets can be riskier than investing in established foreign markets due to increased volatility, lower trading volume, and higher risk of market closures. In many emerging markets, there is substantially less publicly available information, and the available information may be incomplete or misleading. Legal claims are generally more difficult to pursue. The Strategy may invest in preferred stock and hybrid securities, which may have special risks. Preferred and hybrid securities may include provisions that permit the issuer, at its discretion, to defer distributions for a stated period without any adverse consequences to the issuer. Some preferred and hybrid securities are non-cumulative, meaning that the dividends do not accumulate and need not ever be paid. A portion of the Strategy’s assets may include investments in non-cumulative preferred or hybrid securities, under which the issuer does not have an obligation to make up any arrears to its investors. Preferred and hybrid securities may be substantially less liquid than many other securities, such as common stocks or US government securities. Generally, preferred and hybrid security holders (such as the Strategy) have no voting rights with respect to the issuing company unless preferred dividends have been in arrears for a specified number of periods, at which time the security holders generally may select a number of directors to the issuer’s board. Generally, once all the arrears have been paid, the security holders no longer have voting rights. In certain varying circumstances, an issuer of preferred or hybrid securities may redeem the securities prior to a specified date. For instance, for certain types of preferred or hybrid securities, a redemption may be triggered by a change in federal income tax or securities laws. A redemption by the issuer may negatively impact the return of the security held by the Strategy.

Important information

Source for all performance data unless noted: Macquarie.

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^Note: Here and throughout this analysis, unless otherwise indicated, the analysis assumes 60% debt at an 8% interest rate and 40% equity at a 12% cost. See page titled "Levelized Cost of Energy Comparison - Sensitivity to Cost of Capital" for cost of capital sensitivities.

(1) Given the limited public and/or observable data available for new-build geothermal, coal and nuclear projects the LCOE presented herein reflects Lazard's LCOE v14.0 results adjusted for inflation and, for nuclear, are based on then estimated costs of the Vogtle Plant. Coal LCOE does not include cost of transportation and storage.
(2) The fuel cost assumptions for Lazard's LCOE analysis of gas-fired generation, coal-fired generation and nuclear generation resources are \$3.45/MMBTU, \$1.47/MMBTU and \$0.85/MMBTU respectively, for year-over-year comparison purposes. See page titled "Levelized Cost of Energy Comparison - Sensitivity to Fuel Prices" for fuel price sensitivities.
(3) Reflects the average of the high and low LCOE marginal cost of operating fully depreciated gas peaking, gas combined cycle, coal and nuclear facilities, inclusive of decommissioning costs for nuclear facilities. Analysis assumes that the salvage value for a decommissioned gas or coal asset is equivalent to its decommissioning and site restoration costs. Inputs are derived from a benchmark of operating gas, coal and nuclear assets across the U.S. Capacity factors, fuel, variable and fixed operating expenses are based on upper- and lower-quartile estimates derived from Lazard's research. See page titled "Levelized Cost of Energy Comparison—New Build Renewable Energy vs. Marginal Cost of Existing Conventional Generation" for additional details.
(4) Represents the illustrative midpoint LCOE for Vogtle nuclear plant units 3 and 4 based on publicly available estimates. Total operating capacity of ~2.2 GW, total capital cost of ~\$31.5 billion, capacity factor of ~97%, operating life of 60 – 80 years and other operating parameters estimated by Lazard's LCOE v14.0 results adjusted for inflation. See Appendix for more details.
(5) Reflects the LCOE of the observed high case gas combined cycle inputs using a 20% blend of green hydrogen by volume (i.e., hydrogen produced from an electrolyzer powered by a mix of wind and solar generation and stored in a nearby salt cavern). No plant modifications are assumed beyond a 2% increase to the plant's heat rate. The corresponding fuel cost is \$6.66/MMBTU, assuming ~\$5.25/kg for green hydrogen (unsubsidized PEM). See LCOH - Version 4.0 for additional information.

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