Key Factors for Unleashing American Power Generation

The U.S. power sector is entering a pivotal era. Significant growth in fossil fuel generation is actively underway alongside a renewable surge—all driven by hyperscale data centers, AI computing, and manufacturing expansion demanding reliable, dispatchable power at scale.

With electricity demand projected to increase nearly 50% by 2050 and major grid operators already revising their forecasts upward at record pace, the pressure to bring new capacity online has never been greater. For developers and utilities, success will depend not just on engineering—but on navigating a complex web of federal, state, and local regulatory requirements with speed and precision.

WHAT'S DRIVING DEMAND?

Projected U.S. power sector generation in 2026, up from ~4,250 TWh in 2025—and forecasts to grow to over 4,300 TWh in 2026. These three forces are reshaping the American energy landscape—creating unprecedented urgency for new generation capacity and demanding agile regulatory strategies.

AI & HYPERSCALE DATA CENTERS

106 GW

BloombergNEF (Dec 2025) projects data center electricity demand to reach 106 GW by 2035—a 36% increase from their outlook just seven months prior. The exponential growth of AI computing is the single largest demand driver.

MANUFACTURING EXPANSION

30 GW

The PJM Interconnection (Northern Virginia, Pennsylvania, Ohio) is forecast to see 30 GW of growth driven by manufacturing reshoring alongside data center build-out—a trend accelerating nationally.

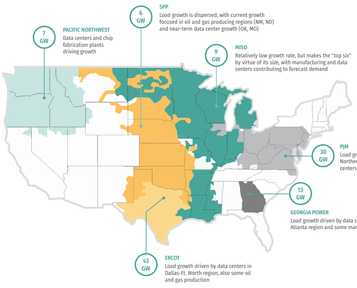
GRID RELIABILITY PRESSURE

37 GW

ERCOT alone has forecasted a 37 GW increase in its 2029 forecast, with utilities filing Integrated Resource Plans showing massive data center demand. Reliability pressures are pushing coal retirements to be delayed—even reversed.

WHERE LOAD GROWTH IS HAPPENING

Six regional grid operators are driving the majority of capacity demand through 2029. Each is shaped by distinct local industry—data centers, manufacturing, oil & gas, and chip fabrication.



Source: GridStrategies

THE ENERGY MIX

Solar dominated 2025 capacity additions, accounting for roughly 73% of new generation. But utilities are simultaneously expanding fossil fuel capacity to meet the immediate needs of dispatch reliability and accelerating demand—creating a dual-track buildout, not an either/or transition.

Renewable Additions (2025) — ~73% of new capacity

Non-Renewable Additions — ~27% of new capacity

Solar Share of Renewables — 19 of 26 GW added

Non-renewables closing the gap: new natural gas combined-cycle plants, simple cycle turbines, coal life extensions, and diesel backup systems are all accerelating.

NAVIGATING THE PERMITTING LANDSCAPE

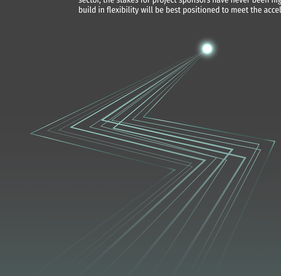
Permitting is the critical path for power project success. Air timelines alone range from immediate to 2+ years depending on source type and area classification—and that's just one of four major domains every project must navigate simultaneously.

Air Permitting Timeline: Recent Power Project Examples

EXPEDITED	INTERMEDIATE	EXTENDED
IMMEDIATE **~1 GW Emergency Generation** Severe Ozone Nonattainment: aggressive emissions controls + stringent operational restrictions. Leverage Permit-by-Rule or Standard/General Permits.	6 MONTHS – 1.5 YEARS **1×1 Combined-Cycle Combustion Turbine** Ozone Nonattainment: emissions netting to avoid PSD/NNSR; baseline period selection; contemporaneous shutdowns + ERCs strategy.	6 MONTHS – 2 YEARS **2×1 Combined-Cycle Combustion Turbine** Attainment: BACT including GHG; air dispersion short-term rates; limited guidance for backup fuel in Class I AQRV analyses.
4 WEEKS – 6 MONTHS **~1 GW Simple-Cycle Combustion Turbine** Attainment Area: aggressive emissions controls. Leverage state-specific expedited approval mechanisms.	~6 MONTHS **Simple-Cycle Turbine Uprating** Attainment: transmission upgrade impacts on emission rates; NSPS KKKKa modification/reconstruction reconstruction determination; project aggregation analysis.	6 MONTH – 2 YEARS **Coal Asset Life Extension** RMRR uncertainty + NSR risk; NSPS KKKKa modification/reconstruction; load analyses for short-term emission rates; atypical background concentrations.

THE PATH TO UNLEASHING AMERICAN POWER

With electricity demand projected to grow nearly 50% by 2050 and $625M allocated to reinvigorating the coal sector, the stakes for project sponsors have never been higher. Project sponsors who start permitting early and build in flexibility will be best positioned to meet the accelerating demand curve.



START SITE SELECTION EARLY
Identify regulatory entanglements, legacy contamination, wetlands, and NEPA nexus before capital commitment

SCOPE AIR PERMITTING REALISTICALLY
Understand PSD/NNSR applicability, BACT requirements, and dispersion modeling needs for your specific source type

ENGAGE UTILITY COMMISSIONS PROACTIVELY
Participate in IRP processes and build the public record that justifies need—before the CPCN application

SECURE WATER RIGHTS EARLY
Especially in western states—water right acquisition can be among the longest-lead items on a project schedule

The window to act on America's power generation opportunity is now—and permitting timelines don't wait. Trinity Consultants brings the regulatory expertise, local market knowledge, and cross-disciplinary teams to help project sponsors move faster and smarter. Contact us today at 972.661.8100 or visit trinityconsultants.com.

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