nuveen
A TIAA Company

October 2025

Power in transition

Charting a path to a sustainable energy future through private equity investments

Ted Maa
Managing Director,
Private Equity Impact Investing

Anna Lewandowska
Vice President,
Private Equity Impact Investing

KEY THEMES:

- *Power demand is accelerating, driven by data center growth, electrification of transport and industry, and population increases.*
- *Power supply is becoming more volatile and less predictable due to extreme weather and a larger share of renewables like solar and wind, which generate electricity at variable rates.*
- *The widening gap between demand and supply is causing more frequent outages and higher power prices, putting pressure on household and business budgets and threatening the continuity of essential services.*
- *Bridging this gap will require significant investment on both the supply and demand sides, creating opportunities for private equity to help build a more resilient, affordable and sustainable energy system.*

THE GROWING STRAIN ON POWER INFRASTRUCTURE

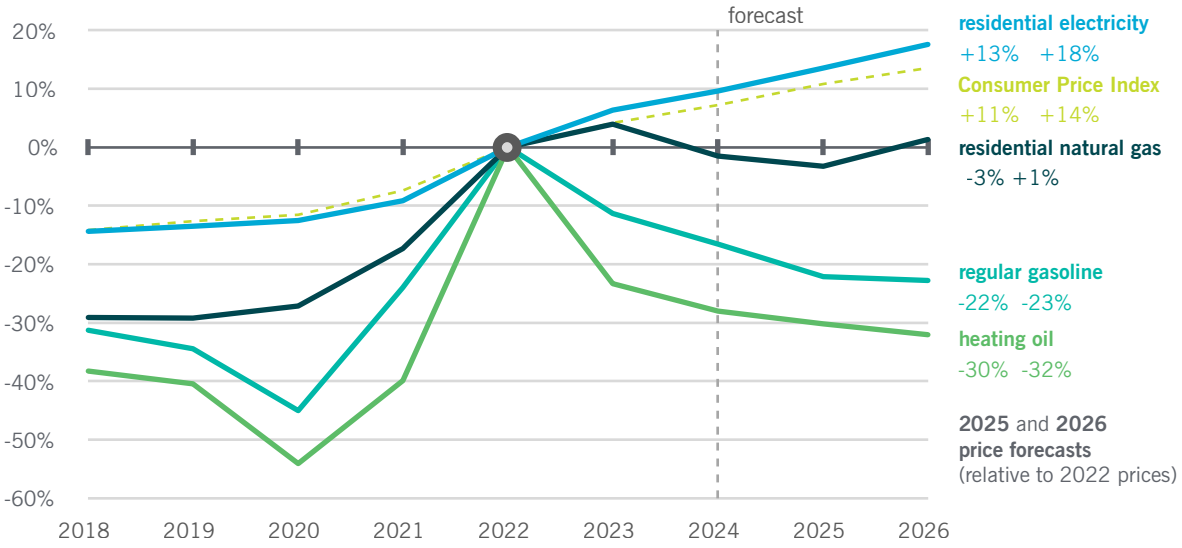
Over the past decade, several forces have combined to push electricity demand to new heights. The rapid expansion of data centers, the electrification of transportation and industry, and steady population growth are all driving up the need for reliable power. At the same time, the supply side is struggling to keep pace. Extreme weather events are becoming more frequent, and the grid's growing reliance on variable renewable sources like solar and wind makes output less predictable. These factors together create a widening gap between what consumers need and what the grid can consistently deliver.

This has several consequences:

- **Rising energy costs:** Households, businesses, and municipalities are seeing higher energy bills, which ripple through the economy as increased costs for goods and services.
- **Frequent outages:** Service interruptions are more common during extreme weather or sudden demand spikes. Even brief disruptions can halt operations, spoil inventory, or endanger vulnerable populations.
- **Critical services at risk:** Hospitals, schools, shelters, and public safety facilities face heightened mission-critical operational risks from unreliable power and require practical solutions to maintain continuity.

Figure 1: U.S. electricity prices continue steady increase

Selected retail energy prices and Consumer Price Index (2018-2026)
percentage change relative to 2022



Source: U.S. Energy Information Administration, Short-Jorm Energy Outlook, May 2025

- **Utility challenges:** Utilities need scalable, rapidly deployable solutions beyond building new large-scale power plants or transmission lines to meet customer expectations for uninterrupted service.

SOLVING THE POWER IMBALANCE

Addressing the challenges in today's power sector requires a coordinated approach that tackles both the demand for electricity and the ways it is supplied. By reducing unnecessary consumption and investing in resilient, flexible supply resources, we can create a more reliable and affordable energy system. Together, these approaches lower bills, cut outages, and reduce emissions while waiting years for new large-scale power plants or long-haul transmission lines.

Below, we outline the key strategies on each side of the meter.

Demand-side solutions

Demand-side solutions focus on reducing the amount of energy consumed, especially during peak periods. Their approach targets behaviors and end-user technology adaptation, to shift towards better resource efficiency and utilization. These solutions are often the fastest and most cost-effective way to relieve grid stress and lower costs for customers. The recent Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC), showed that demand-side solutions have the potential to reduce GHG emissions from end-use sectors by 40%–70% by 2050 without compromising service levels.[1]

- **Efficient lighting and controls:** Upgrading to LED fixtures and installing smart sensors (such as occupancy and daylight sensors) immediately reduces electricity use and maintenance costs, with savings reflected on utility bills.
- **Smart cooling/heating systems and motor automation:** Implementing automated schedules and temperature setpoints for fans and pumps ensures systems only run when needed, cutting energy use and peak demand without sacrificing comfort.
- **Data-driven optimization:** Leveraging meter-based analytics allows organizations to identify operational inefficiencies and implement fixes quickly, with results verified directly at the meter.

Supply side solutions

Supply-side solutions strengthen the grid by adding local resources that can generate or store electricity on-site. These solutions help customers manage price spikes, maintain operations during outages and support grid stability. Given the quick development and dispatch times for these supply solutions, they are expected to be a key part of bridging the energy supply/demand imbalance.

- **On-site clean energy generation:** Installing rooftop or parking-canopy solar panels allows facilities to produce a portion of their own power, reducing reliance on the grid during expensive hours and providing a hedge against rising prices.
- **Battery storage:** Batteries store electricity when it's cheap and discharge during peak periods or outages, lowering demand charges and keeping critical systems online.
- **Backup generators:** Backup generators are essential for supporting vital operations during extended outages. Often combined with solar and battery systems, and coordinated by microgrid controls, these resources enable facilities to operate independently from the grid during emergencies and maximize overall resilience.

Attractive investment opportunity

We believe the ongoing transformation of the power sector presents a compelling entry point for private equity investment. Surging demand for reliable, efficient energy, driven by data centers, commercial and industrial clients and essential services, has created urgent market needs that traditional infrastructure alone cannot address. This environment can generate strong, durable growth opportunities for investors who can back companies delivering services and software that optimize energy use and enhance grid resilience. These companies not only address urgent market needs but can also align well with private equity impact investors' objectives for scaleable growth, resilient cash flows and measurable impact.

Below are the characteristics that we believe make power services and software businesses attractive private equity investments:

- **Resilient value proposition:** Solutions that lower energy bills and reduce operational risk are demanded by energy users under any macroeconomic backdrop. This creates durable demand, even when budgets are tight, and ensures that providers are less vulnerable financially in economic downturns.
- **Robust free cash flow:** Capital-light business models allow providers to convert a high share of earnings into cash. This supports reinvestment, add-on services and potential attractive returns for investors.
- **Recurring and verifiable revenues:** Service, software and pay-for-performance contracts tie payments directly to measured outcomes. Auditable results reduce disputes and improve the quality of revenue streams.
- **Scalable growth:** Multisite customers, standardized scopes and utility programs enable providers to expand efficiently, compounding growth without reinventing the wheel for each project. This also shortens sales cycles over time.
- **Diversified market exposure:** Providers serve commercial, industrial and public-sector customers across many regions, reducing policy and credit concentration risks. Multiple service lines such as lighting, HVAC, controls and storage create diverse paths to growth.
- **Positioned for AI adoption:** There is opportunity for businesses in this sector to leverage AI to better integrate with utility-level data, enabling real-time insights and predictive analytics. These capabilities can drive measurable energy savings for customers, optimize grid interactions and unlock new value streams through advanced demand forecasting, automated controls and tailored efficiency solutions.
- **Impact-aligned expansion:** Lower bills, fewer outages for essential services and reduced emissions are aligned with impact goals in a way that is easy to measure and verify.

Common challenges

While we believe the power solutions sector offers attractive risk-adjusted returns, we recognize that there are certain challenges that need to be carefully considered before making an investment in the space:

- **Policy and regulatory uncertainty:** Changes in incentives, such as tax credits for solar projects, can alter project economics and slow adoption. Diversifying service offerings across states, incentive programs and technologies helps reduce exposure to policy risk.
- **Lengthy customer decision cycles:** Energy projects often compete with other budget priorities, leading to extended approval timelines. Clear articulation of value, rapid payback periods, and strong relationships with multisite customers can help accelerate decision-making and expand project scope.
- **Measurement and verification:** If energy savings aren't accurately measured and verified, customer confidence and payment reliability can suffer. Leveraging meter-based measurement and third-party verification ensures results are auditable and payment is tied to outcomes.
- **Interconnection and permitting delays:** Installing on-site energy systems can be slowed down by utility coordination and permitting requirements. Engaging utilities early and designing systems to operate primarily on-site (behind the meter) can help reduce wait times, while pairing solar with battery storage can further simplify the approval process.

Nuveen portfolio case studies

Case study: ALLY ENERGY SOLUTIONS

Ally Energy Solutions ("Ally") is a power solutions provider serving commercial and industrial clients nationwide. The company specializes in demand-side upgrades, as well as supply-side and recurring operations and maintenance services. Leveraging deep expertise, Ally has built repeatable engagement across Fortune 500 portfolios, consistently delivering measurable energy savings and resilience. Over its history, Ally has helped clients avoid approximately 578,000 tons of cumulative CO_2 emissions through more than 1,000 projects.

Nuveen Value Add: Nuveen is supporting Ally in scaling its national reach and capabilities, enabling the company to serve clients across multiple sites and geographies. This partnership aims to help Ally deepen its impact by delivering reliable, cost-saving energy solutions nationwide.

Case study: Power TakeOff

Power TakeOff ("PTO") helps utilities find energy efficiency opportunities at scale leveraging a proprietary AI / ML algorithm on utility smart meter data with a focus on small- and medium-size businesses and public institutions. PTO operates on a pay-for-performance basis, resulting in verifiable energy savings that benefit the Company, its clients and the environment. PTO has realized well over 100 GWh of savings since inception.

Nuveen PE Impact Value Add: Nuveen is working with PTO to partner with our commercial real estate team with the goal to identify energy efficiency opportunities at scale to help find meaningful savings for our real estate portfolio while also helping PTO potentially increase revenue from utility clients.

Examples are for illustrative purposes only. The selected examples, case studies and/or transaction summaries presented or referred to herein may not be representative of all transactions of a given type, or of investments generally and are intended to be illustrative of the types of investments that have been made and does not constitute investment advice or recommendation of past investments. It should not be assumed that the investment team will make equally successful or comparable investments in the future Moreover, actual investments will be made under different market conditions from those investments presented or referenced and may differ substantially from the investments presented herein as a result of various factors. Results experienced may not be representative of the experience of other investments and there is no guarantee of future performance or success of these investments displayed above.

NUVEEN'S FOCUS AREAS

We continue to be excited by the opportunities we see in the power solutions space, particularly those with the following characteristics:

- Picks-and-shovels business services that generate revenues directly from capital spending to provision clean energy and improve energy efficiency.
- Software solutions that leverage AI, IoT or data analytics to optimize energy use, provide real-time monitoring and provide measurable cost and energy savings to the end consumer.
- Energy-as-a-Service models that solve the upfront capital challenge for end users, offer strong recurring revenue streams and align incentives between providers and customers.
- Green materials and retrofit-focused solutions that enhance existing infrastructure in older buildings and industrial facilities with minimal disruption.

For more information, please visit our website, nuveen.com/impact.

Endnotes

1 https://www.sciencedirect.com/science/article/pii/S2542435123005329

Disclosures

This material, along with any views and opinions expressed within, are presented for informational and educational purposes only as of the date of production/writing and may change without notice at any time based on numerous factors, such as changing market, economic, political, or other conditions, legal and regulatory developments, additional risks and uncertainties and may not come to pass. There is no promise, representation, or warranty (express or implied) as to the past, future, or current accuracy, reliability or completeness of, nor liability for, decisions based on such information, and it should not be relied on as such. This material should not be regarded by the recipients as a substitute for the exercise of their own judgment. It is important to review your investment objectives, risk tolerance and liquidity needs before choosing an investment style or manager.

This material is not intended to be a recommendation or investment advice, does not constitute a solicitation to buy, sell or hold a security or investment strategy and is not provided in a fiduciary capacity. The information provided does not take into account the specific objectives or circumstances of any particular investor, or suggest any specific course of action. Investment decisions should be made based on an investor's objectives and circumstances and in consultation with their financial advisors. Financial professionals should independently evaluate the risks associated with products or services and exercise independent judgment with respect to their clients.

This material may contain "forward-looking" information that is not purely historical in nature. Such information may include, among other things, projections, forecasts, estimates of yields and/or market returns, and proposed or expected portfolio composition. No representation is made that the forward looking information presented will be achieved, or that every assumption made in achieving, calculating or presenting either the forward-looking information or the historical performance information herein has been considered or stated in preparing this material. Any changes to assumptions that may have been made in preparing this material could have a material impact on any of the data and/or information presented herein by way of example.

Important information on risk

Past performance is no guarantee of future results. All investments carry a certain degree of risk, including the possible loss of principal, and there is no assurance that an investment will provide positive performance over any period of time. Certain products and services may not be available to all entities or persons. There is no guarantee that investment objectives will be achieved. See the applicable product literature for details.

Investors should be aware that alternative investments are speculative, subject to substantial risks including the risks associated with limited liquidity, the potential use of leverage, potential short sales, currency exchange rates, and concentrated investments and may involve complex tax structures and investment strategies. Alternative investments may be illiquid, there may be no liquid secondary market or ready purchasers for such securities, they may not be required to provide periodic pricing or valuation information to investors, there may be delays in distributing tax information to investors, they are not subject to the same regulatory requirements as other types of pooled investment vehicles, and they may be subject to high fees and expenses, which will reduce profits.

Private equity and private debt investments, like alternative investments are not suitable for all investors given they are speculative, subject to substantial risks including the risks associated with limited liquidity, the potential use of leverage, potential short sales, concentrated investments and may involve complex tax structures and investment strategies. Investments in middle market loans are subject to certain risks. These investments are subject to credit risk and potentially limited liquidity, as well as interest rate risk, currency risk, prepayment and extension risk, inflation risk, and risk of capital loss.

Responsible investing incorporates Environmental Social Governance (ESG) factors that may affect exposure to issuers, sectors, industries, limiting the type and number of investment opportunities available, which could result in excluding investments that perform well.

This information does not constitute investment research, as defined under MiFID

Nuveen, LLC provides investment solutions through its investment specialists.

nuveen

A TIAA Company

WF3167500 4933190