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Will Natural Gas Fuel the Growth of AI?

Artificial intelligence (“AI”) is widely expected to be the next great disruptive technology, but for AI to reach its potential, a significant increase in electrical power generation and transmission will be required. While most new power capacity has come from renewable energy in recent years, we believe natural gas will play a critical role in satisfying AI’s voracious appetite for electricity over the next several years. Below, we discuss some of the reasons that natural gas may be well-suited to meet our growing energy needs. We then highlight how the First Trust North American Energy Infrastructure Fund (EMLP) may benefit from growing electricity demand from AI and other sources.

Rising Forecast for Electricity Demand

Over much of the past two decades, electricity demand in the U.S. was relatively flat, growing by less than 1% per year.¹ However, the convergence of new electricity-intensive technologies—especially AI, cryptocurrencies, and electric vehicles—along with a significant increase in the construction of new semiconductor and battery factories, has prompted utilities and grid operators to radically adjust their forecasts. The Federal Energy Regulatory Commission (“FERC”) estimates that the growth of base energy demand from 2024 to 2029 rose from 3.6% in 2022 to 12.5% in 2024, more than tripling the expected growth rate for the next five years.²

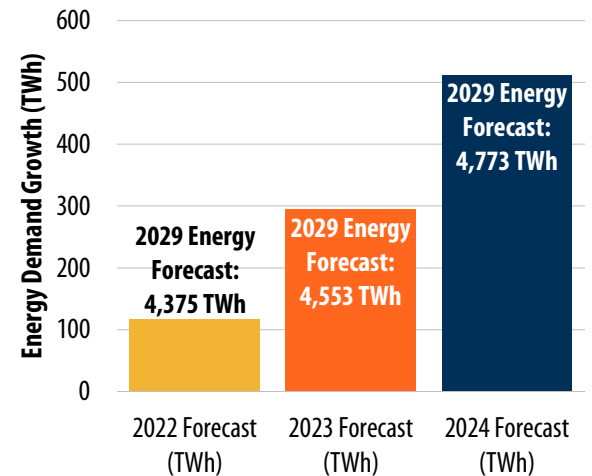
Balancing Electricity Supply and Demand

A significant challenge for expanding electrical power production in the coming years is the substantial demand expected to come from AI data centers, which require consistent, reliable power on a 24/7 basis. However, most additions to U.S. power generation capacity over the next five years are expected to come from intermittent sources, especially solar (66%) and wind (18%).³ When considering planned retirements of current facilities, solar (101%) and wind (28%) make up an even larger share of net additions (see Chart 2). Large investments in battery storage are planned to help manage the variability of renewable energy, but high costs of storage could jeopardize the economic feasibility of some initiatives, especially for long-term seasonal storage. Natural gas will contribute 15% to new capacity, or 23% if we account for plant retirements.⁴

Another strategy to increase carbon-free, reliable energy is to expand nuclear power production. Recognizing the potential of nuclear, several technology companies have begun to explore this option. For example, Microsoft recently signed a 20-year power purchase agreement with Constellation Energy (“Constellation”), which announced plans to restart one of its nuclear reactors at Three Mile Island in Pennsylvania.⁵ Before it was retired in 2019, this power plant was producing electricity at maximum capacity over 96% of the time. In October, Google announced an agreement with Kairos Power to purchase nuclear energy from multiple small modular reactors that are expected to be brought online from 2030-2035.⁶

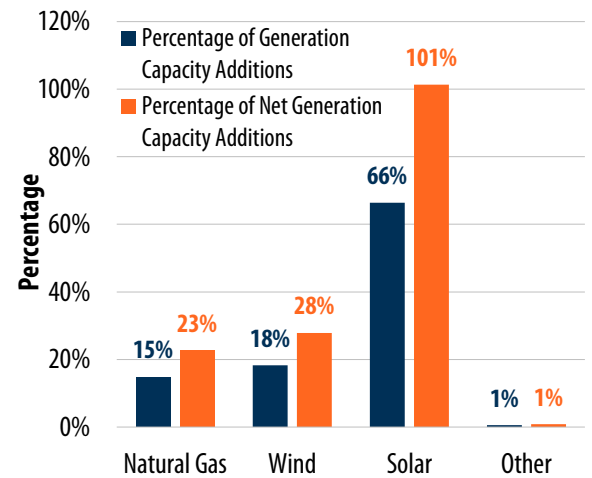
While nuclear power is both clean and reliable, adding new capacity has been no easy task, with long lead times and high costs. The last nuclear power plant built from scratch in the U.S. (the Vogtle nuclear power plant in Georgia) took 14 years and \$30 billion to bring online, which was twice as long as planned and double the expected cost.⁷ Bringing old nuclear reactors back online might be cheaper than constructing new ones, but there are limited and scattered opportunities where this makes economic sense, and such renovations may also take several years.⁸ Constellation plans to spend \$1.6 billion to restart the nuclear reactor at Three Mile Island, which won’t be back online until 2028.⁹

Chart 1: Five Year Nationwide Energy Demand Forecast in Terawatt-Hours (TWh)



Source: Grid Strategies, December 2024. **There is no guarantee that past trends will continue or projections will be realized.**

Chart 2: Planned Electric Capacity Additions Through 2029 (as of 9/30/2024)



Source: U.S. Energy Information Administration. Data as of 9/30/2024. **There is no guarantee that past trends will continue or projections will be realized.**

¹Grid Strategies, *Strategic Industries Surging: Driving US Power Demand*. December 2024.

²Grid Strategies and FERC, December 2024.

³U.S. Energy Information Administration. Data as of 9/30/24.

⁵Constellation Energy, September 2024.

⁶Google, October 2024.

⁷U.S. Energy Information Administration, May 2024.

⁸MIT Technology Review, “How to Reopen a Nuclear Power Plant.” April 2024.

References to specific securities should not be construed as a recommendation to buy or sell and should not be assumed profitable.

We believe that the intermittent nature of renewable energy, coupled with the long lead times and high costs associated with nuclear power, likely enhances the role of natural gas-fired electricity in meeting the increasing demand for power. Natural gas is reliable, domestically abundant, relatively inexpensive, and significantly cleaner than coal.

Recent statements from key market players support this outlook, in our opinion. GE Vernova, a leading supplier of natural gas turbines, recently highlighted a surge in demand, projecting 20 GW in new natural gas turbine orders for 2024, up from 11 GW in 2023, with 9 GW in recent slot reservations expected to turn into orders by mid-2025.¹⁰ They forecast at least 20 GW in orders yearly through 2028, suggesting robust growth for manufacturers and infrastructure owners over the next several years.

The First Trust North American Energy Infrastructure Fund (EMLP)

The First Trust North American Energy Infrastructure Fund (EMLP) is an actively-managed ETF that invests in publicly-traded U.S. and Canadian energy infrastructure companies formed as corporations and master limited partnerships (MLPs). The fund invests in operators of non-cyclical energy infrastructure assets such as pipelines that transport natural gas and utilities that produce and transport electricity.

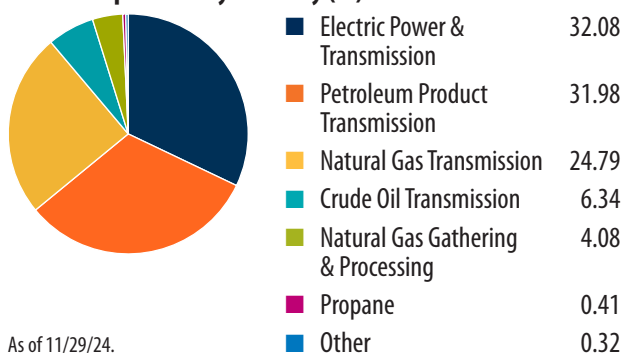
A recent announcement that Meta signed a 15-year contract with Louisiana utility Entergy to provide 2.26 gigawatts of natural gas fired power generation (representing 17% of current Louisiana demand) for their new data center shows the advantage of being a large vertically integrated utility offering “one-stop shop” solutions.¹¹ Vertically integrated utilities like Entergy are typically allowed to earn a regulated rate of return on capital investments. Thus, expenditures on power plants and transmission lines may translate into revenue and earnings growth. While more than 60% of the industry’s future capital expenditure is allocated toward grid reliability and the renewable transition, many utilities are planning to increase investment in power generation in anticipation of higher energy demand.¹²

We believe certain natural gas pipeline operators—depending on their location—are uniquely placed to capitalize on increasing energy demands due to their pivotal role in the energy supply chain. New pipelines are typically backed by long-term contracts, providing stability and earnings growth potential, even as new natural gas-fired generation and expanded liquefied natural gas (“LNG”) export capacity support further growth in natural gas demand. U.S. power generation from natural gas recently hit record highs, accounting for nearly half of the electricity in the contiguous US in August 2024.¹³

Furthermore, as renewable energy sources like wind and solar continue to grow, natural gas could play an increasingly important role in stabilizing the grid against their intermittent output.

In our opinion, AI has the potential to boost efficiency and productivity for many organizations, spurring profits and economic growth in the years ahead. However, AI will not only require significant investments in semiconductors and data centers, but also in electric power generation and transmission. As president-elect Donald Trump pointed out in a recent interview with Jim Cramer, “. . .we're going to be way ahead of AI. And we've gotta produce tremendous amounts of electricity. You know that it's unbelievable when you think that we need more than twice what we already have. . .but we'll be able to do it.”¹⁴ We tend to agree. And as that power is transported as hydrocarbons through pipelines or electrons through wires, we believe investors in EMLP may benefit.

EMLP Composition by Industry (%)



¹⁰GE Vernova, December 2024 Investor Meeting.

¹¹Energy Income Partners, Investor's Business Daily, and S&P Global, December 2024.

¹²Energy Income Partners and Sector & Sovereign Research (SSR): Utilities and Renewable Energy, October 2024.

¹³Energy Income Partners and EIA "Today in Energy," EIA, October 2024.

¹⁴Donald Trump interview with Jim Cramer at the New York Stock Exchange, CNBC, December 2024.

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Performance Summary (%)	as of 11/29/24			as of 9/30/24			
	1 Month	3 Month	YTD	1 Year	5 Year	10 Year	Since Fund Inception
EMLP Performance*							
Net Asset Value (NAV)	11.87	16.56	41.81	31.76	9.82	6.22	8.29
Market Price	12.12	16.67	42.05	32.03	9.80	6.23	8.30
Index Performance**							
S&P 500® Index	5.87	7.15	28.07	36.35	15.98	13.38	14.66
Blended Benchmark	8.02	9.67	33.57	33.46	12.81	7.45	9.04

Performance data quoted represents past performance. Past performance is not a guarantee of future results and current performance may be higher or lower than performance quoted. Investment returns and principal value will fluctuate and shares when sold or redeemed, may be worth more or less than their original cost. You can obtain performance information which is current through the most recent month-end by visiting www.ftportfolios.com.

Inception Date: 6/20/2012. Total Expense Ratio: 0.96%.

*NAV returns are based on the fund's net asset value which represents the fund's net assets (assets less liabilities) divided by the fund's outstanding shares. **Market Price** returns are determined by using the midpoint of the national best bid offer price ("NBBO") as of the time that the fund's NAV is calculated. Returns are average annualized total returns, except those for periods of less than one year, which are cumulative.

**Performance information for each listed index is for illustrative purposes only and does not represent actual fund performance. Indexes do not charge management fees or brokerage expenses, and no such fees or expenses were deducted from the performance shown. Indexes are unmanaged and an investor cannot invest directly in an index.

You should consider a fund's investment objectives, risks, and charges and expenses carefully before investing. Contact First Trust Portfolios L.P. at 1-800-621-1675 or visit www.ftportfolios.com to obtain a prospectus or summary prospectus which contains this and other information about a fund. The prospectus or summary prospectus should be read carefully before investing.

Risk Considerations

You could lose money by investing in a fund. An investment in a fund is not a deposit of a bank and is not insured or guaranteed. There can be no assurance that a fund's objective(s) will be achieved. Investors buying or selling shares on the secondary market may incur customary brokerage commissions. Please refer to each fund's prospectus and Statement of Additional Information for additional details on a fund's risks. The order of the below risk factors does not indicate the significance of any particular risk factor.

Unlike mutual funds, shares of the fund may only be redeemed directly from a fund by authorized participants in very large creation/redemption units. If a fund's authorized participants are unable to proceed with creation/redemption orders and no other authorized participant is able to step forward to create or redeem, fund shares may trade at a premium or discount to a fund's net asset value and possibly face delisting and the bid/ask spread may widen.

The Canadian economy is heavily dependent on the demand for natural resources and agricultural products. Canada is a major producer of certain commodities and any conditions that affect the supply and demand of these products could have a negative impact on the Canadian market as a whole and any a fund that invests in the securities of Canadian issuers.

Changes in currency exchange rates and the relative value of non-US currencies may affect the value of a fund's investments and the value of a fund's shares.

Current market conditions risk is the risk that a particular investment, or shares of the fund in general, may fall in value due to current market conditions. For example, changes in governmental fiscal and regulatory policies, disruptions to banking and real estate markets, actual and threatened international armed conflicts and hostilities, and public health crises, among other significant events, could have a material impact on the value of the fund's investments.

A fund is susceptible to operational risks through breaches in cyber security. Such events could cause a fund to incur regulatory penalties, reputational damage, additional compliance costs associated with corrective measures and/or financial loss.

Companies that issue dividend-paying securities are not required to continue to pay dividends on such securities. Therefore, there is a possibility that such companies could reduce or eliminate the payment of dividends in the future.

Energy infrastructure companies may be directly affected by energy commodity prices, especially those companies which own the underlying energy commodity. A decrease in the production or availability of commodities or a decrease in the volume of such commodities available for transportation, processing, storage or distribution may adversely impact the financial performance of energy infrastructure companies. In addition, energy infrastructure companies are subject to significant federal, state and local government regulation in virtually every aspect of their operations, which may negatively impact their financial performance.

Equity securities may decline significantly in price over short or extended periods of time, and such declines may occur in the equity market as a whole, or they may occur in only a particular country, company, industry or sector of the market.

A fund may be a constituent of one or more indices or models which could greatly affect a fund's trading activity, size and volatility.

As inflation increases, the present value of a fund's assets and distributions may decline.

Large capitalization companies may grow at a slower rate than the overall market.

The portfolio managers of an actively managed portfolio will apply investment techniques and risk analyses that may not have the desired result.

Market risk is the risk that a particular security, or shares of a fund in general may fall in value. Securities are subject to market fluctuations caused by such factors as general economic conditions, political events, regulatory or market developments, changes in interest rates and perceived trends in securities prices. Shares of a fund could decline in value or underperform other investments as a result. In addition, local, regional or global events such as war, acts of terrorism, spread of infectious disease or other public health issues, recessions, natural disasters or other events could have significant negative impact on a fund.

A fund faces numerous market trading risks, including the potential lack of an active market for fund shares due to a limited number of market makers. Decisions by market makers or authorized participants to reduce their role or step away in times of market stress could inhibit the effectiveness of the arbitrage process in maintaining the relationship between the underlying values of a fund's portfolio securities and a fund's market price.

Master limited partnerships ("MLPs") are subject to certain risks, including price and supply fluctuations caused by international politics, energy conservation, taxes, price controls, and other regulatory policies of various governments. In addition, there is the risk that MLPs could be taxed as corporations, resulting in decreased returns from such MLPs.

The benefit a fund derives from its investment in MLPs is largely dependent on their being treated as partnerships for U.S. federal income tax purposes. A change in current tax law or a change in the underlying business mix of a given MLP could result in an MLP being treated as a corporation for income tax purposes which would result in the MLP being required to pay income tax at the applicable corporate tax rate.

A fund that holds cash or invests in money market or short-term securities may be less likely to achieve its investment objective and could lose money.

A fund classified as "non-diversified" may invest a relatively high percentage of its assets in a limited number of issuers. As a result, a fund may be more susceptible to a single adverse economic or regulatory occurrence affecting one or more of these issuers, experience increased volatility and be highly concentrated in certain issuers.

Securities of non-U.S. issuers are subject to additional risks, including currency fluctuations, political risks, withholding, lack of liquidity, lack of adequate financial information, and exchange control restrictions impacting non-U.S. issuers.

A fund and a fund's advisor may seek to reduce various operational risks through controls and procedures, but it is not possible to completely protect against such risks. The fund also relies on third parties for a range of services, including custody, and any delay or failure related to those services may affect the fund's ability to meet its objective.

The market price of a fund's shares will generally fluctuate in accordance with changes in the fund's net asset value ("NAV") as well as the relative supply of and demand for shares on the exchange, and a fund's investment advisor cannot predict whether shares will trade below, at or above their NAV.

A fund with significant exposure to a single asset class, country, region, industry, or sector may be more affected by an adverse economic or political development than a broadly diversified fund.

Securities of small- and mid-capitalization companies may experience greater price volatility and be less liquid than larger, more established companies.

Trading on an exchange may be halted due to market conditions or other reasons. There can be no assurance that a fund's requirements to maintain the exchange listing will continue to be met or be unchanged.

Utilities companies are subject to imposition of rate caps, increased competition, difficulty in obtaining an adequate return on invested capital or in financing large construction projects, limitations on operations and increased costs attributable to environmental considerations and the capital market's ability to absorb utility debt. Utilities companies may also be affected by taxes, government regulation, international politics, price and supply fluctuations, volatile interest rates and energy conservation.

First Trust Advisors L.P. (FTA) is the adviser to the First Trust fund(s). FTA is an affiliate of First Trust Portfolios L.P., the distributor of the fund(s).

The information presented is not intended to constitute an investment recommendation for, or advice to, any specific person. By providing this information, First Trust is not undertaking to give advice in any fiduciary capacity within the meaning of ERISA, the Internal Revenue Code or any other regulatory framework. Financial professionals are responsible for evaluating investment risks independently and for exercising independent judgment in determining whether investments are appropriate for their clients.

Definitions

The **Blended Benchmark** (EMLPBLEND) consists of the following two indices: 50% of the PHLX Utility Sector Index which is a market capitalization weighted index composed of geographically diverse public U.S. utility stocks; and 50% of the Alerian MLP Total Return Index which is a float-adjusted, capitalization weighted composite of the 27 most prominent energy Master Limited Partnerships (MLPs). The Blended Benchmark returns are calculated by using the monthly return of the two indices during each period shown above. At the beginning of each month the two indices are rebalanced to a 50-50 ratio to account for divergence from that ratio that occurred during the course of each month. The monthly returns are then compounded for each period shown above, giving the performance for the Blended Benchmark for each period shown above.

The **S&P 500® Index** is an unmanaged index of 500 companies used to measure large-cap U.S. stock market performance.