

Power Play

May, 2024

Summary

- In May, most asset classes performed well, with U.S. equities leading the way. Both large cap and small cap stocks rose 5%. Intermediate-term bonds also experienced gains, ending the month up 1.7%, marking their best monthly return this year.
- While AI excitement remains centered on mega-cap technology companies, there is growing attention on the infrastructure needed for AI development, particularly the vast data and significant electricity required to train and run learning models.
- At the sector level, information technology was the top market performer in May, gaining 10%. Utilities followed closely, ending the month up 8%.
- Markets have benefitted from the easing of inflation pressures, but maintaining stability requires keeping both inflation and bond yields contained.

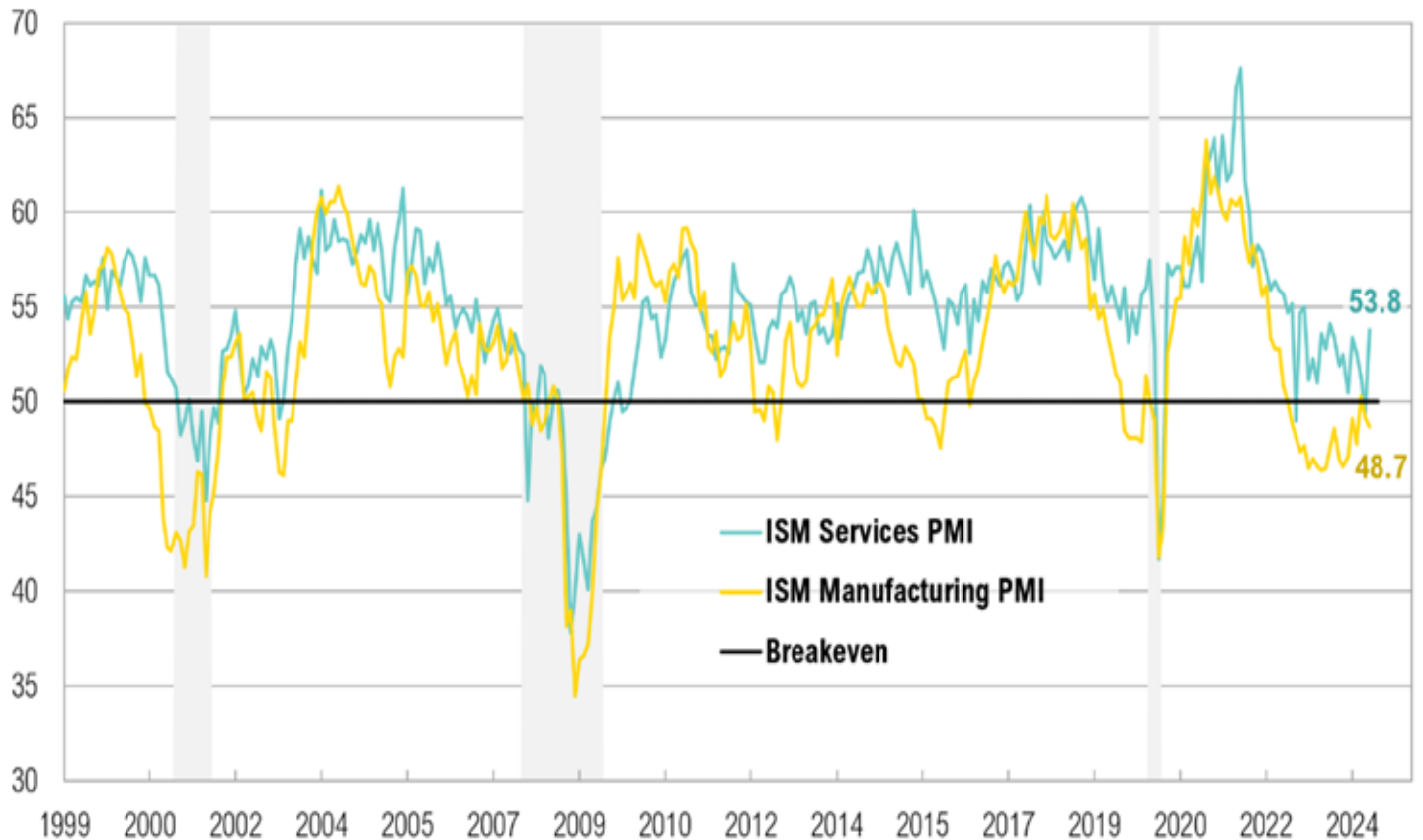
Overview

May was a nearly ideal month for most asset classes. U.S. equities fared best, with both U.S. large cap stocks and U.S. small cap stocks ending the month up 5.0%. Even the downtrodden bond market ended the month in the green. U.S. intermediate-term bonds ended May up 1.7%—their best monthly return this year.

Revised first-quarter gross domestic product (GDP) estimates showed annualized quarter-over-quarter GDP growth lowered from 1.6% to 1.3%, driven primarily by declines in consumer spending, as personal consumption was revised down from 2.5% to 2.0%. After dipping into contractionary territory in April, the ISM Manufacturing PMI showed continued weakness in May, dropping further into contractionary territory with a reading of 48.7. In contrast to the stalling manufacturing sector, the services sector rebounded in May. The ISM Services PMI hit 53.8 (after briefly dipping into contractionary territory in April with a reading of 49.4). The April inflation report, released in May, showed headline inflation slightly decreasing from 3.5% year-over-year to 3.4%. The core inflation print of 3.6% year-over-year was the lowest in three years.

Services Sector Activity Rebounded in May, While Manufacturing Activity Stalled

ISM Services & Manufacturing PMIs



Source: Bloomberg

In May, the Federal Open Market Committee (FOMC) yet again kept interest rates unchanged. During the meeting, Fed Chair Jerome Powell expressed concerns about a “lack of further progress” on inflation. He also announced a more aggressive-than-expected quantitative tightening (QT) taper: starting June 1, the monthly redemption cap on Treasury securities will decrease from \$60 billion to \$25 billion. Despite inflation remaining above 3% and surpassing the Fed’s official 2% target for over three years, the Fed’s recent QT taper decision indicates a more accommodative approach to enduring higher inflation. Market expectations for interest rate cuts continued to hover between one and two for 2024, and the first cut is expected at the September FOMC meeting.

By the end of May, 98% of S&P 500 companies had reported first-quarter earnings results. Earnings growth for the quarter steadily improved from 3.4% at the end of March to 5.9% by the end of May. Notably, full-year 2024 and 2025 earnings per share estimates have increased, driven primarily by the communication services and information technology sectors. Both earnings growth and S&P 500 stock market performance have largely been driven by a handful of mega-cap companies. Nvidia, Microsoft, Apple, and Alphabet together added over \$1.4 trillion in market cap over the past month, surpassing the combined gains of the other 296 stocks that ended the month positive. More than half of the gains were driven by Nvidia alone, which ended the month up 25%. At a sector level, information technology was the top-performing sector, gaining 10% over May, followed by the utilities sector, which ended the month up 8%.

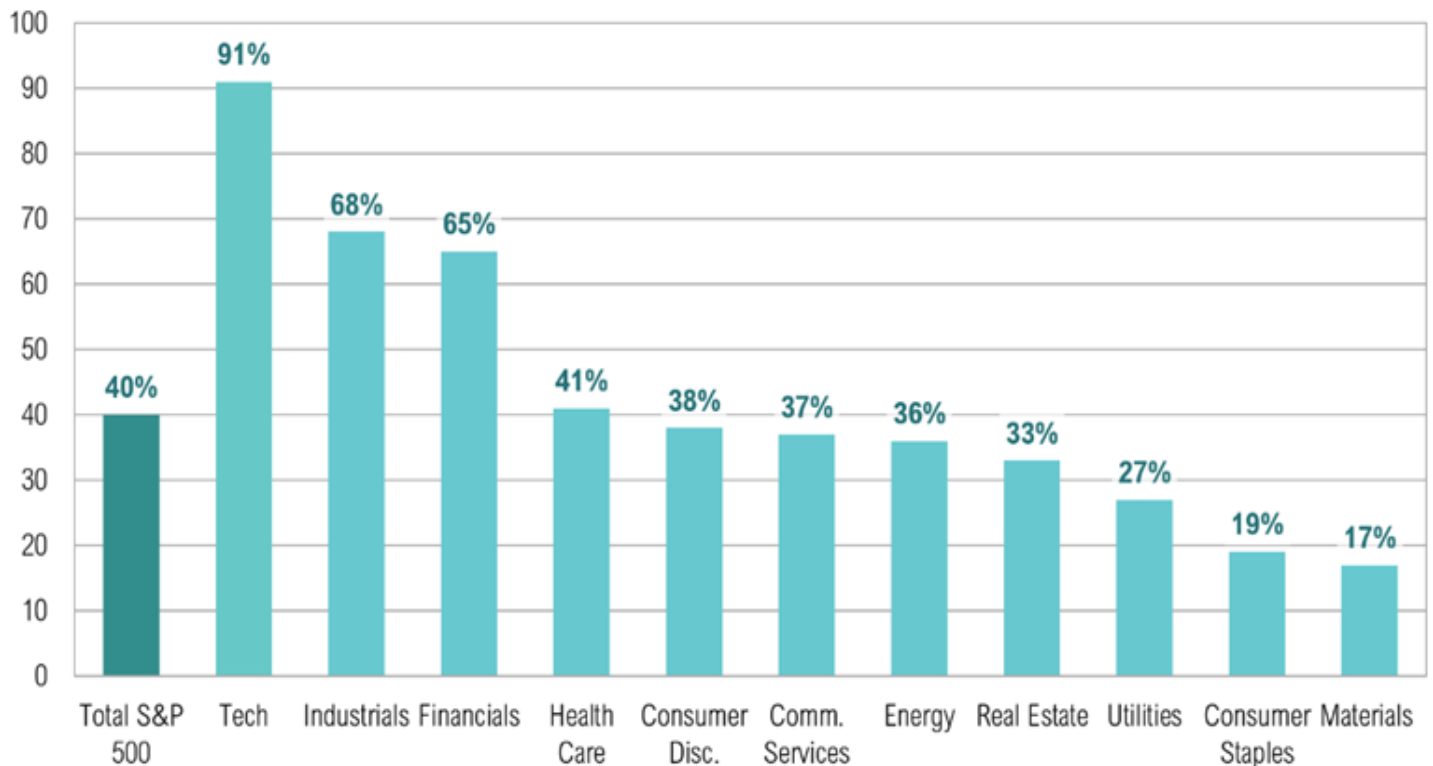
Power Play

Coincidentally, May 2023 was dominated by the artificial intelligence (AI) boom, triggered by the release of OpenAI's ChatGPT in November 2022 and fueled by surging investor excitement about the potential impact of AI on the global economy. Nvidia, a key driver of the AI boom, saw its share price gain more than 40% in May 2023 after announcing first-quarter earnings results that far exceeded expectations due to rising demand for AI microchips. Over the past year, the excitement surrounding AI has persisted. Nearly 40% of S&P 500 companies (around 200) mentioned "AI" in their first-quarter 2024 earnings calls, almost double the number of mentions in first-quarter earnings calls last year.

Although AI excitement continues to revolve primarily around a handful of mega-cap technology companies, some of the focus has shifted to the infrastructure needed to support the continued development of the technology. Over the past year, it has become clear that artificial intelligence requires vast amounts of data to train learning models, which in turn demands significant electricity usage. For example, estimates show that AI applications, such as ChatGPT-3, may consume up to ten times the energy used by Google for the same search. Furthermore, AI-model training requires large numbers of graphics processing unit (GPU) servers and specialized data centers to accommodate the intense computational demands. These data centers consume significant amounts of water (for cooling), energy, and land. The amount of land needed for an AI data center can vary significantly, ranging between 10 to 1,200 acres—which is the size of the data center campus recently purchased by Amazon. A study by the University of California has found that OpenAI's ChatGPT-3 "consumes" a 16-ounce bottle of water (for cooling purposes) for every 10-50 responses it generates. The study also found that training a large language model (such as ChatGPT-3) in Microsoft's high-end data centers can evaporate around 185,000 gallons of water per day.

40% of S&P 500 Companies Mentioned "AI" on Q1 2024 Earnings Calls

% of S&P 500 Companies Citing "AI" on Q1 Earnings Calls



Source: FactSet

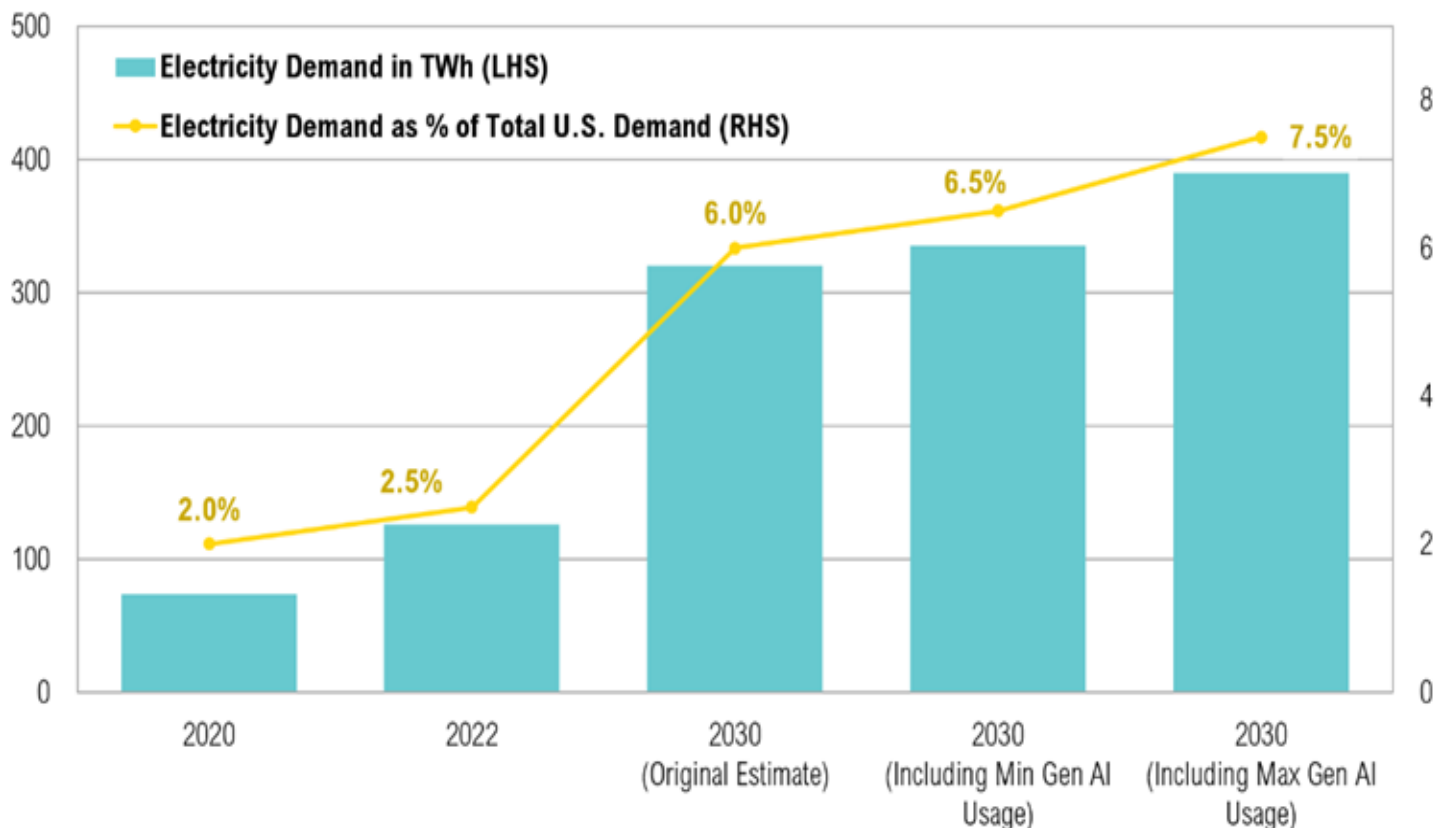
In the U.S., power generation has remained relatively stable over the past 20 years, growing modestly by around 0.4% a year. Electricity demand has also remained relatively steady over this time. However, this stability is likely to be disrupted as the demand for (and from) AI and data centers escalates. Recent studies suggest that the volume of data generated by businesses and consumers in the next five years will double that of the past decade. Forecasts by Boston Consulting Group indicate that data centers could account for between 6.0% and 7.5% of total electricity demand by 2030, necessitating an annual increased production of between three and seven gigawatts of new power capacity to meet these needs. This represents a 15% compound annual growth rate, equal to the electricity consumed by one-third of U.S. homes.

In order to meet these energy demands, the U.S. has started to push back the retirement dates of the country’s aging coal fleet. Approximately 4% of the country’s total coal-powered electricity capacity is to be retired by 2030—a 40% downward revision from last year. However, coal’s share of power continues to decline, and ongoing reliance on coal is recognizably unsustainable. Instead, companies have started to turn to nuclear power as a solution. Narratives around nuclear power have begun shifting, with the United Nations in December 2023 recognizing its significant role in reducing carbon emissions and mitigating climate change. At the 28th United Nations Climate Change Conference of the Parties (COP28), companies from 140 different countries signed the Net Zero Nuclear Industry Pledge, committing to support the expansion of nuclear energy to achieve net-zero emissions by 2050. Twenty nations, including the U.S., France, Sweden, and the United Arab Emirates, have committed to triple nuclear energy capacity by 2050.

AI and Data Centers Expected to be Key Drivers of Future U.S. Power Demand

U.S. Data Center Electricity Demand, TWh

U.S. Data Center Electricity Demand, % of Total



Source: BCG

Nuclear power has also piqued the interest of Silicon Valley, and both startups and mega-cap tech companies have begun investing. Oklo, a startup backed by the founder of OpenAI, Sam Altman, started trading on the New York Stock Exchange in May. Oklo aims to develop mini nuclear reactors to power data centers, including those used by AI companies. Amazon recently purchased a 100% nuclear-powered data center in Pennsylvania from Talen Energy. The data center is expected to be powered directly by the neighboring nuclear power plant, Susquehanna, with Amazon committing up to 960 megawatts of power from the plant over the next several years. Meta CEO Mark Zuckerberg believes the key challenge for AI over the next few years will be energy constraints. According to Zuckerberg, energy constraints have held back Meta's own data center buildout. Also potentially adding to power needs driven by AI demand, Microsoft is reportedly considering building a \$100 billion supercomputer campus to develop AI models in a project called Stargate.

While nuclear power appears to be one of the emerging leaders in meeting AI and data center energy requirements, it will not be an immediate solution. There are currently 60 nuclear reactors being constructed worldwide, and an additional 110 are planned to start over the next five years. However, there are currently only thirteen nuclear reactors proposed in the U.S., which have not yet been approved. The average construction timeline for a nuclear plant in the U.S., from approval to becoming operational, generally ranges between seven and ten years.

AI's energy requirements have inevitably led to increased attention on the U.S. utilities sector, especially those companies generating and distributing electricity for data centers. These companies tend to primarily reside in the historically low-growth utilities sector. Between 2018 and 2022, earnings growth across the S&P 500 utilities sector was negative, and revenue growth fell below the average inflation rate of 3.6% over the period. However, many of these companies are now estimated to grow at 6% or more per year over the next 15 years. Despite being the second worst-performing S&P 500 sector over the past five years (trailing only real estate), the utilities sector is the top-performing S&P 500 sector year-to-date, up 15.8%. In comparison, the communication services sector is up 14.9%, and the technology sector is up 9.4%.

Markets

With the exception of U.S. intermediate-term municipal bonds (which ended the month down 0.7%), all major asset classes ended May with positive returns. U.S. large cap stocks and U.S. small cap stocks were the top performers, both ending the month up 5.0%, followed by U.S. REITs, which gained 4.7%. Emerging and frontier market stocks gained 0.6%, while international developed market large cap stocks ended May up 4.0%. U.S. intermediate-term bonds ended the month up 1.7%—the best monthly return this year.

Overseas, the month of May was characterized by presidential elections in several developing market countries. India held its general elections, and the country's National Democratic Alliance won the majority while incumbent Prime Minister Narendra Modi won a historic third term. On May 29, South Africa held national elections, and the African National Congress lost majority power for the first time in 30 years. On June 2, Mexico held its general elections, with Claudia Sheinbaum, of the Party of the Democratic Revolution, winning outright. The MSCI South Africa Index ended the month essentially flat (down 0.1%) while the MSCI Mexico Index ended the month down 2.5% and the MSCI India Index gained 0.7%. Year to date, the MSCI India Index is up 9.3%, though the MSCI South Africa Index is down 4.3% and the MSCI Mexico Index is down 5.7%. Twenty-one emerging economies were scheduled to hold elections this year, and 14 of these elections have already taken place. Among developed market countries, the U.S., the United Kingdom, and France are also holding elections this year.

Looking Forward

The bond market's reaction to upcoming growth and inflation data is something that we will continue to monitor, particularly at the longer end of the yield curve. With the 10-year Treasury yield around 4.5% and the two-year yield near 4.9%, time will tell how well bond markets will tolerate the Fed's relatively lax approach to the "last mile" of inflation. If yields continue to rise, they will likely affect broader markets, especially rate-sensitive segments including real estate, regional banks, non-profitable small caps, and lower-end consumers. Conversely, if yields can stay contained, there could be plenty of continued opportunity for risk assets.

While the immediate impact of any further easing by the Federal Reserve will likely be viewed as positive, persistent inflation could continue to frustrate efforts to manage it. Ultimately, we believe the stability of the economy and markets hinges on keeping inflation and interest rates contained.

As always, if you have any questions or would like to schedule a meeting with one of our investment professionals, please don't hesitate to call us at 508-693-8850.

Sincerely,



Luke Murphy
Managing Director,
Martha's Vineyard Investment Advisors

About Martha's Vineyard Investment Advisors

Martha's Vineyard investment Advisors (MVIA) is an SEC-registered investment advisor that offers comprehensive wealth management, financial planning and retirement solutions for individuals, businesses, and non-profit organizations. By engaging and collaborating with our trusted clients, we help simplify the complexities of managing wealth.

MVIA's knowledgeable advisors offer financial solutions that include:

- Investment Management
- Financial Advisory
- Family Office Services
- Business Consulting
- Estate Planning
- Retirement Planning & Consulting
- Non-Profit Investing
- Comprehensive Financial Planning
- Charitable/Donor Advisement
- 529/Education Planning

Learn more: Visit www.mvinvestmentadvisors.com

Martha's Vineyard Investment Advisors

496 State Road
West Tisbury, MA 02575
(508) 693-8850

www.mvinvestmentadvisors.com

May, 2024

Performance Disclosures

All market pricing and performance data from Bloomberg, unless otherwise cited. Asset class and sector performance are gross of fees unless otherwise indicated.

Citations

1. Bureau of Economic Analysis: <https://www.bea.gov/data/gdp/gross-domestic-product>
2. ISM: <https://www.ismworld.org/supply-management-news-and-reports/reports/ism-report-on-business/pmi/may/>
3. ISM: <https://www.ismworld.org/supply-management-news-and-reports/reports/ism-report-on-business/services/may/>
4. Bureau of Labor Statistics: <https://bls.gov/cpi/home.htm>
5. Reuters: <https://www.reuters.com/markets/rates-bonds/fed-hold-rates-steady-inflation-dims-hopes-policy-easing-2024-05-01/>
6. Federal Reserve: <https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20240501.pdf>
7. CME Group: <https://www.cmegroup.com/markets/interest-rates/cme-fedwatch-tool.html>
8. FactSet: https://advantage.factset.com/hubfs/Website/Resources%20Section/Research%20Desk/Earnings%20Insight/EarningsInsight_053124.pdf
9. Wall Street Journal: <https://www.wsj.com/finance/stocks/this-record-stock-market-is-riding-on-questionable-ai-assumptions-cb890703>
10. PwC: <https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html>
11. McKinsey: <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-economic-potential-of-generative-ai-the-next-productivity-frontier>
12. CNBC: <https://www.cnbc.com/2023/05/24/nvidia-nvda-earnings-report-q1-2024.html>
13. FactSet: <https://insight.factset.com/highest-number-of-sp-500-companies-citing-ai-on-earnings-calls-over-past-10-years>
14. InternationalEnergyAgency: <https://iea.blob.core.windows.net/assets/6b2fd954-2017-408e-bf08-952fdd62118a/Electricity2024-Analysisandforecastto2026.pdf>
15. Data Center Dynamics: <https://www.datacenterdynamics.com/en/news/aws-acquires-talens-nuclear-data-center-campus-in-pennsylvania/>
16. Newsweek: <https://www.newsweek.com/why-ai-so-thirsty-data-centers-use-massive-amounts-water-1882374>
17. Statista: <https://www.statista.com/statistics/188521/total-us-electricity-net-generation/>
18. Statista: <https://www.statista.com/statistics/201794/us-electricity-consumption-since-1975/>
19. Financial Times: https://markets.ft.com/data/announce/detail?dockkey=600-202405150930PR_NEWS_USPRX___CL14418-1
20. Boston Consulting Group via LinkedIn: <https://www.linkedin.com/pulse/impact-genai-electricity-how-fueling-data-center-boom-vivian-lee/>
21. Financial Times: <https://www.ft.com/content/ddaac44b-e245-4c8a-bf68-c773cc8f4e63>
22. World Nuclear Association: <https://world-nuclear.org/news-and-media/press-statements/net-zero-nuclear-industry-pledge-sets-goal-for-tri>
23. NBC News: <https://www.nbcnews.com/tech/tech-news/nuclear-power-oklo-sam-altman-ai-energy-rcna139094>
24. CNBC: <https://www.cnbc.com/2021/06/28/oklo-planning-nuclear-micro-reactors-that-run-off-nuclear-waste.html>
25. American Nuclear Society: <https://www.ans.org/news/article-5842/amazon-buys-nuclearpowered-data-center-from-talen/>
26. Data Center Dynamics: <https://www.datacenterdynamics.com/en/news/metaspark-zuckerberg-says-energy-constraints-are-holding-back-ai-data-center-buildout/>
27. Forbes: <https://www.forbes.com/sites/cindygordon/2024/03/31/microsoft-and-openai-partnering-on-stargate-a-100b-us-data-center/>

May, 2024

Citations—Cont.

28. Reuters: <https://www.reuters.com/technology/microsoft-openai-planning-100-billion-data-center-project-information-reports-2024-03-29/>
29. World Nuclear Association: <https://world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide>
30. Statista: <https://www.statista.com/statistics/712841/median-construction-time-for-reactors-since-1981/>
31. FRED: <https://fred.stlouisfed.org/series/CPIAUCS>
32. Reaves Asset Management: <https://info.reavesam.com/lp-why-is-the-utility-sector-heating-up-for-investors>
33. AP News: <https://apnews.com/article/india-election-results-2024-lok-sabha-modi-bjp-7893efecc83fa8225a611f174e6420ee>
34. BBC: <https://www.bbc.com/news/articles/cgee5n9jen9o>
35. AP News: <https://apnews.com/article/mexico-elections-president-governorships-lopez-obrador-d7fef5c7ac964072401ba6d9809dd7d4>
36. Reuters: <https://www.reuters.com/markets/global-markets-election-pix-graphic-2024-04-09/>
37. AAA: <https://gasprices.aaa.com/>

May, 2024

Disclaimer and Terms of Use

Past performance is no guarantee of future performance. Any opinions expressed are current only as of the time made and are subject to change without notice. This report may include estimates, projections or other forward-looking statements, however, due to numerous factors, actual events may differ substantially from those presented. The graphs and tables making up this report have been based on unaudited, third-party data and performance information provided to us by one or more commercial databases. Additionally, please be aware that past performance is not a guide to the future performance of any manager or strategy, and that the performance results and historical information provided displayed herein may have been adversely or favorably impacted by events and economic conditions that will not prevail in the future. While we believe this information to be reliable, Martha's Vineyard Investment Advisors ("MVIA") bears no responsibility whatsoever for any errors or omissions. Index benchmarks contained in this report are provided so that performance can be compared with the performance of well-known and widely recognized indices. Moreover, the information provided is not intended to be, and should not be construed as, investment, legal or tax advice. Nothing contained herein should be construed as a recommendation or advice to purchase or sell any security, investment, or portfolio allocation. This presentation is not meant as a general guide to investing, or as a source of any specific investment recommendations, and makes no implied or express recommendations concerning the manner in which any client's accounts should or would be handled, as appropriate investment decisions depend upon the client's specific investment objectives.