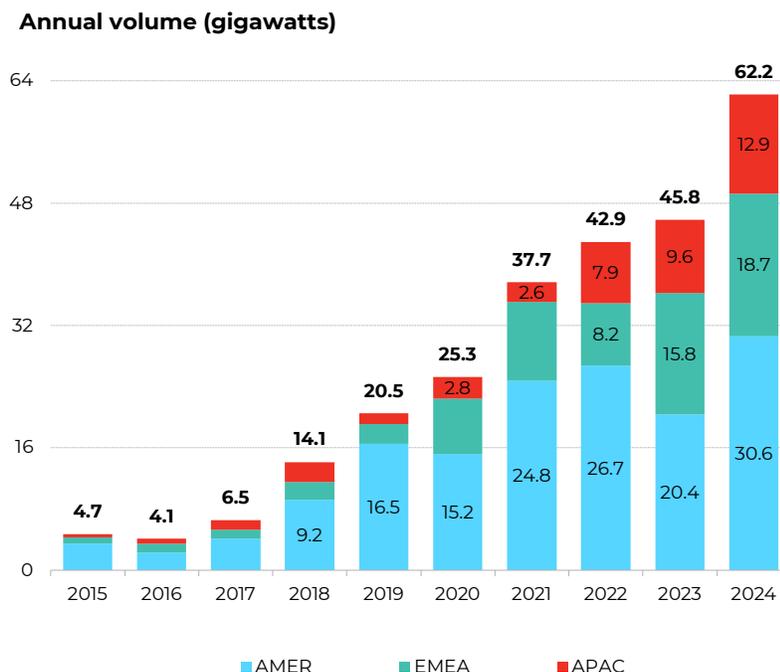


Chart of the Month: Corporate PPA Volumes

Data from BNEF shows that the volume of corporate PPAs (Power Purchase Agreements) signed globally increased 36% in 2024. The Americas region experienced the fastest growth, improving 50% year on year. The four hyperscalers, Amazon, Google, Meta and Microsoft were the largest purchasers of corporate PPAs globally, making up 40% of demand, with around 95% of their agreements being for wind or solar.

Global Energy Transition Investment, by Sector



Source: BNEF. Data as of February 2025.

News

- The European Commission has proposed a plan to make €100bn available to support domestic clean-manufacturing and bolster competitiveness in its energy-intensive industries such as steel, metals, and chemicals. As well as reducing bureaucracy, the proposal would be supported by the European Investment Bank and would provide guarantee schemes to ease costs for long-term renewable power contractors and support grid manufacturers. We will wait to see the results of this proposal, but it's promising to see the commission take action given the bloc's tendency to be "long" on targets, but "short" on actual support.
- Research house Rho Motion has reported that 13.1 million electric vehicles (EVs) were sold globally in January, an 18% increase compared to the same period last year. Despite sales in China falling month-on-month due to Chinese New Year related public holidays, EV sales still grew 12% versus January 2024, with EV penetration at 42% according to CPCA (China Passenger Car Association) data. New emissions standards in Europe helped drive 21% year-on-year growth in EV sales, with Germany alone seeing an increase of 40% compared to January 2024. However, in France the

introduction of a weight tax on PHEVs (plug-in hybrid electric vehicles) led to sales falling 52%. Pleasingly, the US & Canada also reported strong EV sales growth of 22% as EVs continue to penetrate the market.

- In February, a group of US integrated utility companies announced increased capital expenditure (capex) plans to meet growing electricity demand. PPL raised capex plans by 40%, Dominion Energy by 16%, and Duke Energy by 14%, with investment being directed to both new generation and bolstering transmission and distribution lines. The companies commented that demand was being driven by data centers and the electrification of advanced manufacturing as well as building and transportation. Similarly, French grid operator RTE commented that the country would need to spend €100bn by 2040 to reinforce and expand its electricity grids to support growing demand and enable the connection of new supply.
- The head of Solar Supply Chain Research for Wood Mackenzie expects solar module prices to rebound to \$0.12/watt within 6 months as the industry regains a sustainable balance. This would be achieved by removing up to 300 GW (gigawatts) of wafer, cell and module capacity from non-tier 1 Chinese manufacturers with lagging technologies. Any supply side rationalization would be positive for a sector that has suffered from significant overcapacity and depressed profitability, with leading operators running at or below cash costs for significant periods of 2024.
- The sustainable energy space continued to see heightened merger & acquisition activity in February. Having commented on the valuation opportunity in US renewable energy space, Brookfield agreed to acquire National Grid's US onshore renewables business for \$1.74 billion, adding 1.8GW of operational capacity alongside a further 1.3GW under construction. In the same month, Canadian Institutional investor CDPQ agreed to acquire IPP Innergex Renewable Energy for \$6.9 billion. Innergex operates 3.7GW of hydroelectric, wind, solar and battery storage capacity across 90 facilities in Canada, the US, France and Chile, with a further 0.95GW under construction.

Manager's Comments

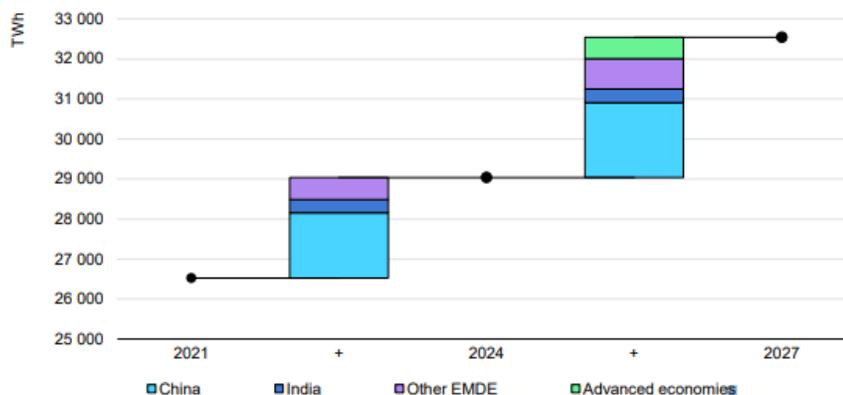
This month, we present a strong outlook for global electricity demand. The developing world continues to lead in terms of growth, driven by SE Asia and China in particular where electricity demand has decoupled from gross domestic product and now represents nearly one third of final energy demand. Data centers, the electrification of buildings and the onshoring of manufacturing is driving an inflection in developed world demand. The long-term secular trend of electrification still has many decades to run.

Global electricity demand is accelerating

Global electricity demand grew by an estimated 4.3% in 2024, having grown at 2.8%pa (per annum) between 2000-2023. The International Energy Agency (IEA) estimates that it will maintain this higher level of growth, averaging ~4%pa until 2027, and adding 3,500 TWh (terawatt hours) of new consumption. For the first time in almost two decades, advanced economies are expected to contribute to this growth but the lion's share (85%) of the growth will come from Emerging Markets, and particularly China. We provide here a summary of the key regional outlooks for demand growth.

Change in electricity demand by region 2021-2027

note: EMDE = Emerging market and developing economies



Source: IEA, 2025

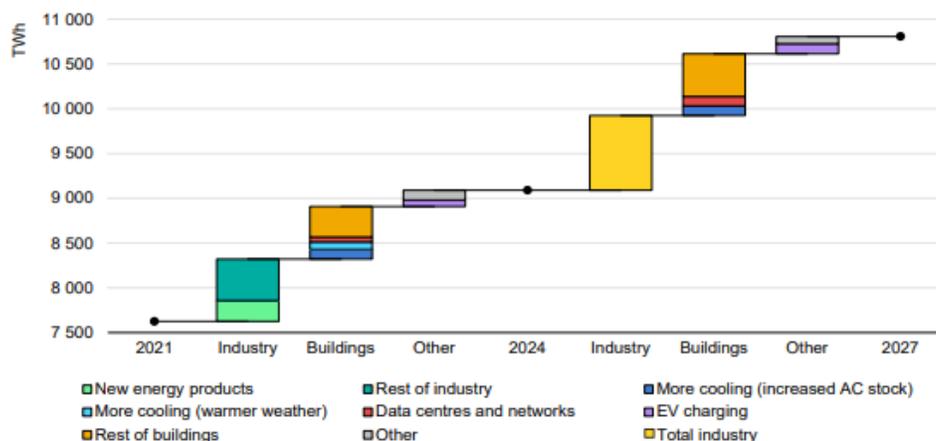
Emerging Markets/China

Asia’s share of world electricity demand has grown from 27% in 2000 to 52% in 2023, with China leading the growth and seeing its share increase from 10% to 32%. China, India and other Southeast Asian economies are expected to represent most of the incremental electricity demand between 2024-2027, with estimated growth of 6%pa, 6.3%pa, and 5%pa respectively over the period.

- India’s robust economic growth, industrial and agricultural expansion, and improved access to electricity has increased peak electricity load 68% since 2014. The electrification of buildings (less than 20% of households have AC) is likely to drive further demand growth, contributing to one third of peak electricity load by 2030. The IEA expects India to account for 10% of the global growth in the 2024-2027 period, with its 6.3%pa growth rate materially larger than its historical average of 5% between 2015-2024.
- Electricity demand in China grew 7% in both 2023 and 2024, in excess of GDP growth of ~5%, marking the end of a period where GDP and electricity demand grew hand in hand (they both increased ~6.5%pa from 2009-2023). Electricity-intensive, low carbon manufacturing (solar PV, batteries, EVs) has expanded industrial demand; the rapid adoption of EVs (50% penetration in 2024) and build-out of charging infrastructure has increased transportation-related demand; and growing AC use and the build out of data centers and 5G infrastructure has driven electricity demand. As a result, the IEA estimates that the share of electricity in total final energy consumption is 28% in China, materially larger than 22% in the US, and 21% in the EU.

The IEA expects Chinese electricity demand growth of 6%pa until 2027, continuing to outgrow GDP growth of 4%pa over the period. Approximately half of this growth will come from industry, driven by both new energy and the broader electrification of industries such as chemicals and refineries. The electrification of buildings and the continued penetration of HVAC products (growing at 6%pa) will also contribute to demand growth.

Estimated drivers of change on electricity demand in China, 2021-2027



Source: IEA, 2024

- Electricity demand in Southeast Asia grew 7.4% in 2024, led by significant growth of over 10% in its two biggest markets, Indonesia and Vietnam. Demand growth in both countries is being driven by robust economic growth expectations, as is growth in the neighboring economies of Malaysia, Philippines and Thailand, albeit it at a slower pace. The IEA expects consumption in the wider region to grow 5% pa over the 2024-2027 period.

Developed Economies

A combination of improving efficiency and the relocation of heavy industries has seen electricity demand in many developed economies remain effectively flat since 2009. A change in this trend is expected with developed economies such as Australia, Canada, the EU, Japan, Korea and the US now expected to contribute to 15% of global growth between 2024-2028.

- An inflection in electricity demand growth in North America was well telegraphed in 2024. Having averaged just less than 0.5%pa growth between 2000-2023 (and fallen 1.8% in 2023), electricity consumption rebounded by 2% in 2024, driven largely by the rapid build out of data center infrastructure. Prior to growth from data centers, more than half of electricity demand growth between 2021-2024 came from robust economic growth, the reshoring of manufacturing and the electrification of buildings more broadly.

The IEA expects US demand to grow ~2% per year through 2027 with announced data center projects alone implying an additional 150 TWh of electricity demand, equivalent to 60% of the incremental demand. After data centers, the reshoring of electricity intensive industry such as semiconductor and battery manufacturing is also expected to drive demand structurally higher.

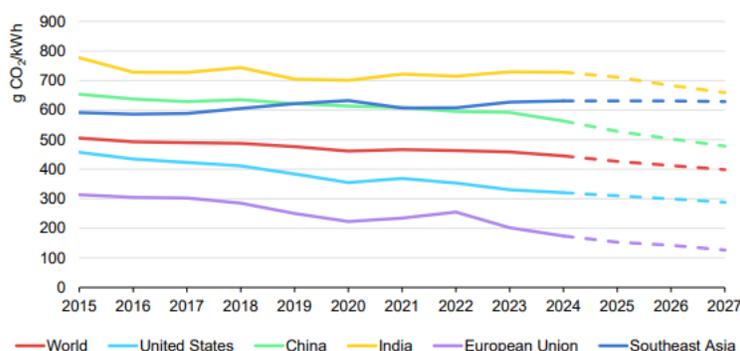
- Electricity demand in the European Union grew by 1.4% in 2024, rebounding after consecutive years of 2.8% and 3.3% declines in 2022 and 2023, driven by an economic slowdown and high energy costs post the Russian invasion of Ukraine. Electricity demand in the EU has fallen around 0.3%pa since 2009 as the bloc has become more efficient and offshored much of its

manufacturing. Despite recent industrial weakness, demand from EVs, heat pumps and data centers has driven demand growth, and a supportive policy environment centered around the REPowerEU deal and the European green deal should support this trend. While the EU is expected to contribute around 6% of global demand growth between 2024-2027, it's not expected to return to its 2021 demand levels until 2027, as weak economic growth and high energy costs dampen the prospects for rapid electrification.

The impact of electrification on global carbon dioxide emissions

Global emissions intensity from electricity generation fell 3% in 2024, driven by growth in renewables and nuclear. Looking ahead, the incremental global demand for electricity between 2024-2027 can be met almost entirely by low-emission renewable sources according to the IEA although the actions of China, representing more than half of global coal fired power generation, will be critical. Given that electricity generation emitted ~13,800 million tonnes of CO2 in 2024, the largest of any sector, the ability to meet incremental demand with low-emission generation is central to staying on track to achieve net zero.

CO2 intensity of electricity generation, 2015-2027



Source: IEA. Data as of February 2025.

With respect to the energy transition, it is clear that the electrification of the global economy is accelerating with electricity expected to satisfy 27% of world energy demand in 2030, relative to 23% in 2023 and 18% in 2015. In advanced and emerging economies alike, consistent drivers such as the electrification of buildings and transport, as well as the build out of data centers are driving electricity consumption structurally higher with emerging economy demand continuing to grow faster. With this in mind, we believe the investment opportunity for the electrification of energy demand and the supply of sustainable energy will be significant for years to come.

GAAEX: March 2025 Monthly Update

Performance

As of 3/31/2025	YTD	1 Year	3 Years	5 Years	10 Years
GAAEX	-4.97%	-15.78%	-7.63%	12.75%	3.08%
MSCI World Index NR	-1.79%	7.04%	7.57%	16.12%	9.49%

As of 12/31/2024	YTD	1 Year	3 Years	5 Years	10 Years
GAAEX	-11.85%	-11.85%	-9.08%	8.72%	4.00%
MSCI World Index NR	18.67%	18.67%	6.33%	11.15%	9.94%

All returns after 1 year annualized.

Inception 03.31.2006 Expense ratio* 1.10% (net); 1.79% (gross)

Performance data quoted represents past performance; past performance does not guarantee future results. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. Current performance of the Fund may be lower or higher than the performance quoted. Performance data current to the most recent month end may be obtained by visiting www.gafunds.com or calling 800-915-6566.

* The Advisor has contractually agreed to reduce its fees and/or pay Fund expenses (excluding Acquired Fund Fees and Expenses, interest, taxes, dividends on short positions and extraordinary expenses) in order to limit the Fund's Total Annual Operating Expenses to 1.10% through June 30, 2027. To the extent that the Advisor absorbs expenses to satisfy this cap, it may recoup a portion or all of such amounts absorbed at any time within three fiscal years after the fiscal year in which such amounts were waived or absorbed, subject to the expense cap in place at the time recoupment is sought, which cannot exceed the expense cap at the time of the waiver. The expense limitation agreement may be terminated by the Board of the Fund at any time without penalty upon 60 days' notice.

Top 10 Fund Holdings as of 2/28/25:

1. Iberdrola SA	5.41%
2. Siemens AG	5.13%
3. Legrand SA	5.09%
4. Nextera Energy Inc	4.93%
5. Schneider Electric SE	4.92%
6. Trane Technologies PLC	4.72%
7. Hubbell Inc	4.49%
8. Eaton Corp PLC	4.36%
9. Itron Inc	4.24%
10. Spie SA	4.16%

MSCI World Index captures large and mid cap representation across 23 Developed Markets countries. With 1,546 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

COP29, or the 29th Conference of the Parties of the United Nations Climate Change Conference, is an annual United Nations Climate Change Conference that brings together world leaders and negotiators from nearly every country to negotiate global goals for tackling climate change, present their countries' plans for contributing to those goals, report on their progress, and agree on actions to address the climate crisis.

Minimum Capital Ratios is a requirement that an organization must meet to ensure it has enough assets to satisfy creditor claims in the event of financial instability or insolvency. The minimum capital ratio is also known as the capital requirement in banking and financial regulation.

Reshoring is the process of returning the production and manufacturing of goods back to the company's original country.

Capital Expenditure (capex) are funds used by a company to acquire, upgrade, and maintain physical assets such as property, plants, buildings, technology, or equipment.

Tier 1 manufacturers directly provide components, materials, or services to an Original Equipment Manufacturer without a middleman, unlike Tier 2 or Tier 3 suppliers, who supply Tier 1 suppliers.

Fund holdings and/or sector allocations are subject to change at any time and are not recommendations to buy or sell any security.

One cannot invest directly in an index.

Earnings Growth is not a measure of future performance.

Opinions expressed are subject to change, are not guaranteed and should not be considered investment advice.

The Guinness Atkinson Alternative Energy Fund's investment objectives, risks, charges and expenses must be considered carefully before investing. The statutory and summary prospectuses contain this and other important information and can be obtained by calling 800- 915-6565 or visiting www.gafunds.com. Read and consider it carefully before investing.

The Fund invests in foreign securities which will involve greater volatility and political, economic and currency risks and difference in accounting methods. The risks are greater for investments in emerging markets. The Fund also invests in smaller and mid-cap companies, which will involve additional risks such as limited liquidity and greater volatility than larger companies. The Fund's focus on the energy sector to the exclusion of other sectors exposes the Fund to greater market risk and potential monetary losses than if the Fund's assets were diversified among various sectors.

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