



Authored by:  
Alexander Roll

Date: May 13, 2024  
Topic: [Thematic](#), [Disruptive Technology](#), [Physical Environment](#)



## GLOBAL X ETFs INSIGHTS

# Data Centres Could Be Another Driving Force in the Transition to Renewables

Data centres are worthy of all the buzz given their role in helping the global economy turn digital. Their network and storage infrastructure and compute capabilities are the backbone of advancing technologies like artificial intelligence (AI), cloud computing, and cryptocurrency mining, among others. The proliferation of these technologies comes with an energy cost, though. Accompanying data centres' growth is an exponential increase in the energy that they consume, creating an urgent need for sustainable solutions to alleviate pressure on already strained energy resources. For investors, renewable energy alternatives offer compelling exposure to growth opportunities, and the burgeoning data centre industry is one that could help accelerate their adoption.

## Key Takeaways

- The data centre industry accounts for more than 1% of the world's power consumption and is expected to reach a hefty 8% by 2030.<sup>1</sup>
- The integration of renewable energy sources is key to mitigating the environmental impact of global data centre energy consumption, facilitating sustainability, and reducing dependence on non-renewable sources during peak-demand periods.
- Climate change, shareholder pressure, and resultant sustainability regulations are among the motivating factors that have providers exploring clean energy options for data centres.

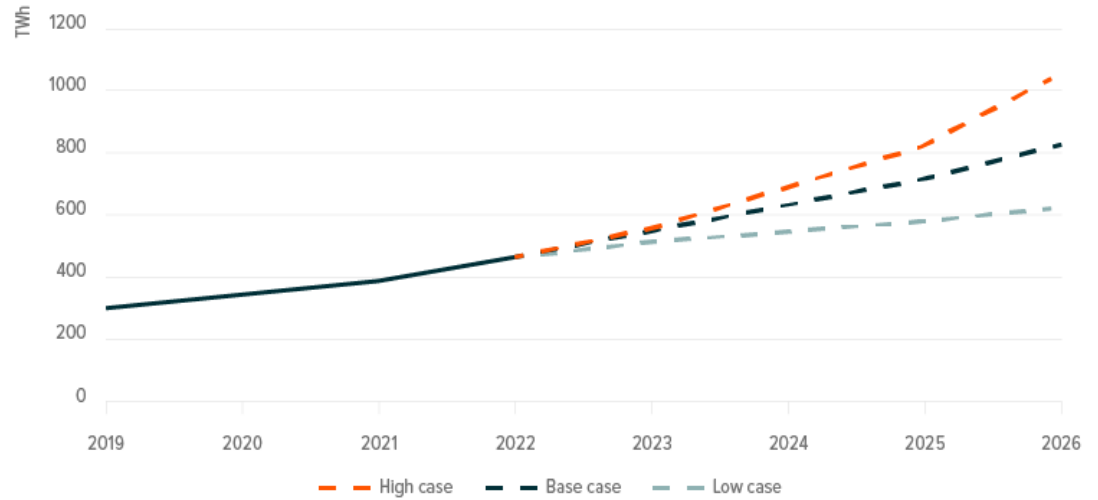
## Data Centres Escalate Demand for Energy

Data centre electricity usage is poised to double as soon as 2026 due to the surge in power-intensive technologies like AI, cloud computing, the internet-of things, and cryptocurrency mining.<sup>2</sup> On a global scale, data centres consume roughly 200 terawatt-hours (TWh) of energy each year, with the top three hyperscalers, Amazon, Microsoft, and Google, responsible for approximately 90 TWh of the consumption.<sup>3</sup> That figure is likely to grow significantly with the full implementation of AI in search tools like Google, perhaps by as much as tenfold.<sup>4</sup> The energy requirements of a typical Google search is 0.3 watt-hours (Wh), while a request made to OpenAI's ChatGPT is 2.9 Wh. Considering that there are approximately 9 billion daily searches translates to additional electricity demand of nearly 10 TWh annually.<sup>5</sup>



## GLOBAL ELECTRICITY DEMAND FROM DATA CENTRES, AI, AND CRYPTOCURRENCIES 2019-2026

Source: Global X ETFs illustration with information derived from: International Energy Agency: Electricity 2024 - Analysis and forecast to 2026. 24 January 2024; Joule (2023), de Vries, The growing energy footprint of AI. 18 October 2023.



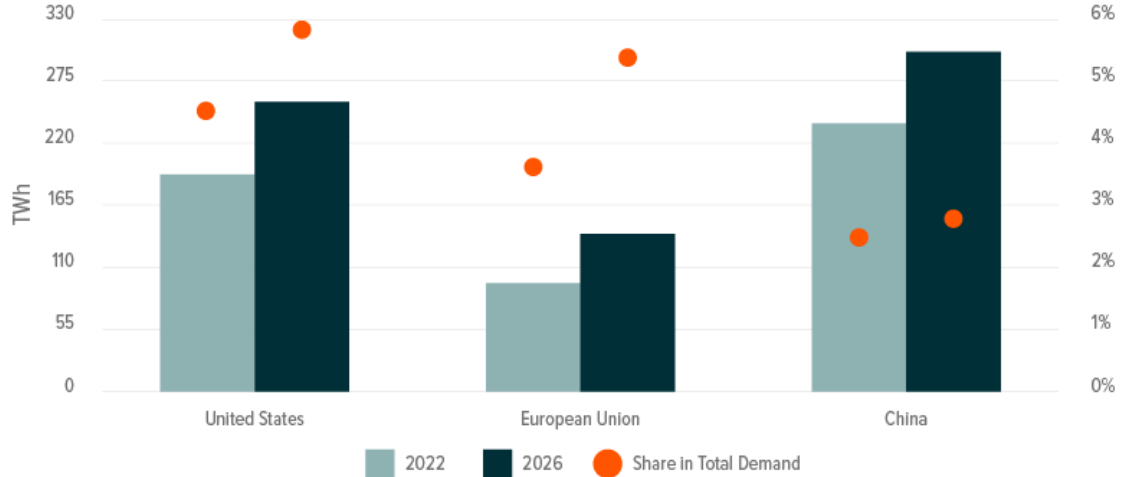
According to the International Energy Agency's (IEA) 2024 annual electricity report, data centres consumed 460 TWh in 2022, a figure that could soar to 650 TWh in a best-case scenario to over 1,000 TWh by 2026 in a worst-case scenario.<sup>6</sup> The rapid expansion of AI-related services driving investments in power-hungry GPUs is likely to increase usage. For example, Nvidia, the dominant player in the AI server market with an estimated 95% market share, has become the primary beneficiary of the demand for computing power to support AI projects.<sup>7</sup> In January, Meta Platforms Inc revealed that it intends to buy more than 350,000 of Nvidia's H100 GPU's by end of the year.<sup>8</sup> The enormous demand is further reflected in Nvidia's Data Centre segment recording a record \$47.5bn in FY2024 revenue, a 217% increase from a year ago.<sup>9</sup>

In the United States, which accounts for 33% of the world's data centres, energy consumption is anticipated to total 260 TWh in 2026, representing approximately 6% of the country's electricity consumption.<sup>10</sup> Available data from Europe shows that in 2018 data centres consumed 76.8 TWh.<sup>11</sup> That number is expected to increase by 28% to 98.5 TWh by 2030 and reach 3.21% of total electricity consumption.<sup>12</sup>



## ESTIMATED DATA CENTRE ELECTRICITY CONSUMPTION AND ITS SHARE IN TOTAL ELECTRICITY DEMAND

Source: Global X ETFs illustration with information derived from: International Energy Agency: Electricity 2024 - Analysis and forecast to 2026. 24 January 2024.

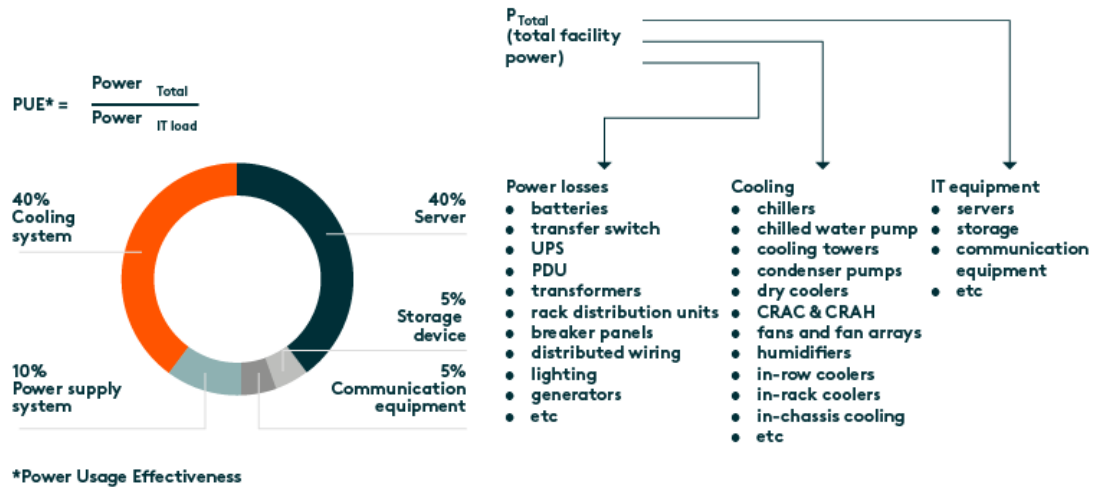


## Data Centre Energy Use Spurs Sustainability Innovation, New Partnerships

Data centres' electricity consumption primarily stems from computing and cooling systems. Computing constitutes approximately 40% of the total electricity demand, and the cooling systems required to maintain optimal processing efficiency account for another 40%.<sup>13</sup> The remaining 20% of electricity usage is attributed to other ancillary IT equipment.

## TYPICAL DATA CENTRE ENERGY USE

Source: Global X ETFs illustration with information derived from: ABB: Motors in data centers powering the connected world. May 2022.



Escalating global data centre energy consumption makes innovation critical to mitigate environmental impacts and ensure sustainability. Renewable energy sources like solar and wind power can help flatten energy consumption profiles and reduce dependence on non-renewable sources, particularly during peak-demand periods.<sup>14</sup> Energy storage and battery technologies will be critical in facilitating efficient management of renewable energy supplies, ensuring uninterrupted operations.<sup>15</sup>

Digital Realty, one of the largest providers of cloud and carrier-neutral data centres, colocation, and interconnection solutions is revolutionizing sustainable data centre solutions and setting new industry standards. The company recently surpassed 1 gigawatt (GW) of sustainable IT capacity, boasting global renewable energy coverage of 64%.<sup>16</sup> The company, which has partnerships with industry leaders such as Nvidia and Schneider Electric to propel AI and sustainability initiatives, aims to extend its deployment of renewable energy generators in the United States and globally.<sup>17</sup> Also, the company leads initiatives like the EU Climate Neutral Data Centre Operator Pact, advocating for industry-wide sustainability standards.<sup>18</sup>

Equinix is regarded as another leader in this field, demonstrating its commitment to green energy integration through strategic partnerships and ground-breaking initiatives. In January 2024, the company signed one of the largest power purchase agreement (PPA) deals in France's history. This 20-year PPA with renewable energy producer wpd will procure energy from a wind farm to help power its data centres.<sup>19</sup>

## Regulations and Initiatives Starting to Shape Data Centre Efficiency

Technological advancements, especially in efficiency, and updated regulations to keep companies in line are essential to manage the surge in data centre energy consumption. Regulatory scrutiny on data centres' energy consumption is starting to intensify with governments imposing stringent mandates.

In March 2024, the EU Commission approved a new Energy Efficiency Directive that introduces a unified scheme to assess the sustainability of data centres with a power demand of 0.5 megawatts (MW) or higher.<sup>20</sup> Beginning in 2026, data centre operators must report sustainability metrics, including total electricity usage and the proportion covered by renewable sources. The objective is to facilitate comparisons among data centres and encourage the implementation of innovative designs or suitable efficiency measures in new and existing facilities. These measures aim to significantly decrease energy and water consumption and encourage the adoption of renewable energy sources, enhance grid efficiency, and facilitate the reuse of waste heat in adjacent facilities and district heating networks.

New regulations at the country level are a trend as well. In late 2023, Germany implemented a new Energy Efficiency Act, stipulating that data centre operators source 50% of their electricity from non-subsidised renewable sources by January 2024 and 100% by January 2027.<sup>21</sup>

## Conclusion: Data Centres Can Promote Renewables Adoption

As the digital landscape expands at an exponential pace, so does data centres' energy consumption. It is believed that the data centre industry's willingness to embrace new technologies that reduce strain on energy grids positions it as a proactive contributor to the solution. Given the industry's essential role in turning the world digital, green data centres could be another major driving force in the transition to renewables, and one that creates compelling investment opportunities along the way.



## Footnotes

1. Arthur D Little, Green Data Centers: Opportunities for decarbonization. September 2023.
2. International Energy Agency: Electricity 2024 - Analysis and forecast to 2026. 24 January 2024.
3. Arthur D Little, Green Data Centers: Opportunities for decarbonization. September 2023.
4. International Energy Agency: Electricity 2024 - Analysis and forecast to 2026. 24 January 2024.
5. Ibid.
6. Ibid.
7. Wheatley, M., Silicon Angle, Nvidia's data center GPU sales grow by stunning 40% on huge demand for AI chips. 21 February 2024.
8. Ibid.
9. Nvidia Newsroom. Nvidia announces financial results for fourth quarter and fiscal 2024. 21 February, 2024.
10. DataCenterDynamics, Global data center electricity use to double by 2026. 26 January 2024.
11. European Commission. Commission takes first step towards establishing an EU-wide scheme for rating sustainability of data centres. 12 December 2023.
12. Ibid.
13. ABB Motors in data centers: Powering the connected world. May 2022.
14. Arthur D Little, Green Data Centers: Opportunities for decarbonization. September 2023.
15. Ibid.
16. Digital Realty. Digital Realty Becomes First Data Center Operator to Reach One Gigawatt of IT Capacity of Sustainable Building Certifications. 29 June 2022.
17. DataCentre Magazine, A. Jackson, Digital Realty Continues Renewable Rollout to the US. 12 April 2024.
18. Schneider Electric, Digital Realty: Leading Sustainable Initiatives Across EMEA. 6 March 2022.
19. DataCenterDynamics, Equinix signs wind PPA in France with wpd. 1 February 2024.
20. European Commission, Data centres in Europe – reporting scheme. 14 March 2024.
21. European Commission. Energy Efficiency Directive. Revision entered into force on 10 October 2023.



The Global X UCITS ETFs are regulated by the Central Bank of Ireland.

This is a marketing communication.

Please refer to the relevant prospectus, supplement, and the Key Information Document (“KID”) of the relevant UCITS ETFs before making any final investment decisions.

Investors should also refer to the section entitled “Risk Factors” in the relevant prospectus of the UCITS ETFs in advance of any investment decision for information on the risks associated with an investment in the UCITS ETFs, and for details on portfolio transparency. The relevant prospectus and KID for the UCITS ETFs are available in English at [www.globalxetfs.eu/funds](http://www.globalxetfs.eu/funds).

Investment in the UCITS ETFs concern the purchase of shares in the UCITS ETFs and not in a given underlying asset such as a building or shares of a company, as these are only the underlying assets that may be owned by the UCITS ETFs.

A UCITS ETF’s shares purchased on the secondary market cannot usually be sold directly back to a UCITS ETF. Investors must buy and sell shares on a secondary market with the assistance of an intermediary (e.g. a stockbroker) and may incur fees for doing so. In addition, investors may pay more than the current net asset value when buying shares and may receive less than the current net asset value when selling them. Changes in exchange rates may have an adverse effect on the value price or income of the UCITS ETF.

Past performance of a UCITS ETF does not predict future returns. Future performance is subject to taxation which depends on the personal situation of each investor, and which may change in the future. Neither past experience nor the current situation are necessarily accurate guides to the future growth in value or rate of return of a UCITS ETF.

Investment may be subject to sudden and large falls in value, and, if it is the case, the investor could lose the total value of the initial investment. Income may fluctuate in accordance with market conditions and taxation arrangements. The difference at any one time between the sale and repurchase price of a share in the UCITS ETF means that the investment should be viewed as medium term to long term.

Any investment in a UCITS ETF may lead to a financial loss. The value of an investment can reduce as well as increase and, therefore, the return on the investment will be variable.

Global X ETFs ICAV is an open-ended Irish collective asset management vehicle issuing under the terms of its prospectus and relevant supplements as approved by the Central Bank of Ireland and is the issuer of certain of the ETFs where stated.

Global X ETFs ICAV II is an open-ended Irish collective asset management vehicle issuing under the terms of its prospectus and relevant supplements as approved by the Central Bank of Ireland and is the issuer of certain of the ETFs where stated.

Communications issued in the European Union relating to Global X UCITS ETFs are issued by Global X Management Company (Europe) Limited (“GXM Europe”) acting in its capacity as management company of Global X ETFs ICAV. GXM Europe is authorised and regulated by the Central Bank of Ireland. GXM Europe is registered in Ireland with registration number 711633.

Communications issued in the United Kingdom and Switzerland relating to Global X UCITS ETFs are issued by Global X Management Company (UK) Limited (“GXM UK”), which is authorised and regulated by the Financial Conduct Authority. The registered office of GXM UK is 77 Coleman Street, London, EC2R 5BJ, UK. Information about GXM UK can be found on the Financial Services Register (register number 965081).



### Information for Investors in Switzerland

This is an advertising document. The state of the origin of the fund is Ireland. In Switzerland, the representative is 1741 Fund Solutions AG, Burggraben 16, CH-9000 St.Gallen. The paying agent is Tellco Bank AG, Bahnhofstrasse 4, 6430 Schwyz.

The prospectus, the key information documents or the key investor information documents, the articles of association as well as the annual and semi-annual reports may be obtained free of charge from the representative.

Past performance is no indication of current or future performance. The performance data do not take account of the commissions and costs incurred on the issue and redemption of units.

