EXPLAINER SERIES

AI: DEVELOPING HUMANITY'S SUPERPOWER ABOVE ALL COSTS

AUTHOR:

KATIE WOODHOUSE, INVESTMENT ANALYST AT **PENGANA WHEB SUSTAINABLE IMPACT FUND**

Barely a day goes by without a fresh news story regarding Artificial Intelligence (AI). Last month, OpenAI released its demo of the latest version of its Chat Bot, ChatGPT 4o, an impressive, if not slightly terrifying, glimpse into the not-so-distant future of AI assistants.[1]

Some of the benefits of AI are clear to see but the famous proverb "with great power comes great responsibility," comes to mind as the race to develop the new technology takes precedence over all other considerations. The societal impact of AI is something that is discussed fiercely in businesses and governments globally. But what are the environmental impacts?

Racing Ahead

Unfortunately, these are not good. According to the International Energy Agency, one query on ChatGPT uses ten times the energy of a standard Google search.[2] These negative impacts of AI were

very visible in May when Microsoft published its 2024 Environmental Sustainability Report. This detailed environmental developments at Microsoft since 2020 when the company announced ambitious pledges, including its aim to be carbon negative and water positive by 2030. Since 2020 however, Microsoft has reported a 30% increase in total scope 1, 2 and 3 greenhouse gas (GHG) emissions, and an 87% increase in water consumption.[3] These increased impacts are almost entirely due to the construction of data centres – the critical infrastructure powering AI.

A few months prior to the publication of the report, Microsoft published its AI Sustainability playbook in which the company argued that "AI is a vital tool to help accelerate the deployment of existing sustainability solutions and the development of new ones – faster, cheaper and better".[4] The irony is not lost on us that AI is seen as a game-changer for accelerating climate solutions when it is currently the main cause of surging energy demand and consequent GHG emissions.

Considering the positive stock market reaction whenever a company mentions AI, it begs the question if Microsoft, as well as the other large tech companies, are highlighting a tension between growth and their short-term shareholders' interest and the long-term interests of our planet.

The data centres required to power AI and cloud-computing are notoriously energy and water intensive. The International Energy Agency (IEA) report that data centre demand comprised 3.6% of total power consumed across the US, Europe and China in 2022. This is forecast to increase to 7% by 2026.[5] To put this in perspective, this is equivalent to the current annual energy usage of Japan.[6] The combined electricity use by Amazon,

Microsoft and Google more than doubled between 2017 to 2021.[7] A gold star to whoever can guess which stocks were the most widely held in ESG funds in 2023, according to Morningstar.[8]

Cleaning up after AI

These huge additional energy demands require substantial investment in new energy infrastructure. Luckily, many of the mega-cap tech companies have ambitious renewable energy targets they are required to meet. While Microsoft is woefully off course in meetings its carbon reduction targets it is nonetheless investing in renewable energy infrastructure. A prime example is the company's huge US$10bn agreement with Brookfield Renewable Partners for the development of 10.5GW of new clean energy projects, coming in at eight times the size of the previous largest renewable energy agreement.[9]

Microsoft in particular has gone some way to atone for their carbon sins. Last month at the Microsoft Build conference, CEO, Satya Nadella, reaffirmed Microsoft's commitment to power it's data centres with 100% renewable energy by 2025.[10] As a result of Nadella's comments, First Solar and Nextracker, US-based manufacturers of solar panels and tracking systems respectively and both held in the fund, rose 18.5% and 13.6% on the day, with other companies in our Cleaner Energy theme not far behind.[11]

Getting this new renewable energy to the data centres will also require substantial upgrades to the grid. This is set to benefit Schneider Electric, a provider of energy management technologies and solutions.

Making sure that any additional energy

requirements are met with renewable power is one way of limiting the negative impacts of AI on the environment. Improving the efficiency with which water and energy are used is another. With 40% of the energy usage of data centres used for cooling the equipment, there is significant need for efficiency. Trane Technologies produce energy-efficient air conditioning systems and related services that are ideal for use in data centres. In the first quarter of 2024, Trane's commercial air conditioning system bookings were up 30% compared to the same quarter in 2023. Similarly, TE Connectivity's Thermal Bridge technology can provide double the improvement in thermal resistance when compared to traditional methods – reducing the need for higher speed fans and lowering energy usage in data centres.[12]

As Microsoft argue in their AI Sustainability sourcebook, AI clearly has the potential to provide solutions that generate real environmental benefits. The current reality however is that AI is just making our existing sustainability challenges even greater. Realising the potential positive impact of AI will only be realised if AI solutions can be delivered with a dramatically lower GHG and water footprint. Within WHEB's investment strategy, we explicitly look for businesses that will help make this a reality.

1. https://chat.chatbotapp.ai/

2. https://iea.blob.core.windows.net/assets/18f3ed24-4b26-4c83-a3d2-8a1be51c8cc8/Electricity2024-Analysisandforecastto2026.pdf

3. https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RW1lMjE

4. https://blogs.microsoft.com/on-the-issues/2023/11/16/accelerating-sustainability-ai-playbook/

5. https://www.iea.org/reports/electricity-2024

6. https://www.ft.com/content/70f3ce57-1d02-4aa9-a94f-d8d728671672

7. https://www.iea.org/reports/electricity-2024

8. https://www.morningstar.com/sustainable-investing/what-stocks-do-esg-funds-own-here-are-three

9. https://www.esgtoday.com/microsoft-signs-largest-ever-corporate-renewable-energy-purchase-deal-with-brookfield/

10. https://news.microsoft.com/wp-content/uploads/prod/2024/05/Satya-Nadella_Transcript_KEY01_Build2024.pdf

11. Factset price data

12. https://www.te.com/en/about-te/perspectives-on-technology/rapid-expansion-of-data-centers.html