



crestone.

A quick guide to artificial intelligence

Benefits and threats to sustainable outcomes



A quick guide to artificial intelligence

Benefits and threats to sustainable outcomes

Artificial intelligence (AI) is transforming the way we think about sustainability. By automating tasks, assessing large data sets, and making predictions, AI not only has the potential to enhance productivity, improve healthcare, and increase access to education, but it can also contribute to fighting climate change. But, while AI is one of the most powerful tools in the fight against climate change, it is also one of the worst offenders. To pave the way to a truly green digital revolution, companies and governments need to start making conscious choices about how they embrace AI.

In this *Quick guide to artificial intelligence*, we provide an overview of the benefits of AI from a sustainability perspective, the risks it poses, as well as what this means for investors.

Enabling problem-solving

AI refers to systems or machines that perform tasks that typically require human intelligence. In its simplest form, it is a field which “combines computer science and robust datasets to enable problem-solving.”¹

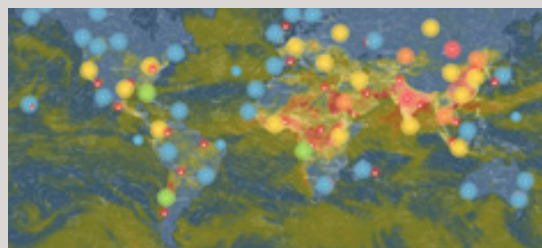
When it comes to sustainability, the need to solve problems rings truer today than ever before. The world is experiencing a triple planetary crisis of climate change, pollution, and biodiversity loss. AI is increasingly being used by governments and companies to help tackle these issues—by assessing their environmental impact, improving their social responsibility, and strengthening governance outcomes.

In the world of environmental, social and governance (ESG) investing, AI is being leveraged to analyse historical and real-time data. This enables investors to measure and compare metrics across companies, industries and regions, which is particularly helpful when dealing with the huge volumes of data that can be material to ESG investing.²

Fighting the climate challenge

On the environmental front, energy efficiency is a key factor for reducing greenhouse gas emissions. By using data from smart meters, weather forecasts and other sources, AI algorithms can learn the patterns and behaviour of energy users, and adjust settings of appliances to minimise energy waste. With approximately 38% of emissions originating from buildings, and 40-50% of building emissions related to heating or cooling systems, this represents a sizeable opportunity. According to UBS, using AI could improve energy efficiency by 15-25% with limited capital costs, and it has the added benefit of increasing the useful life of installed heating, ventilation, and air conditioning systems.³

Informing real-time analysis



UNEP’s World Environment Situation Room, launched in 2022, is one digital platform that is leveraging AI’s capabilities to analyse complex, multi-faceted datasets. The platform curates, aggregates and visualises earth observation and sensor data to inform near real-time analysis and future predictions on factors such as CO₂ atmospheric concentration, changes in glacier mass, and sea level rises.

Source: UN Environment Programme, 2022, How artificial intelligence is helping tackle environmental challenges.

AI can also be used to reduce emissions by improving the reporting of scope 1 and 2 emissions. Other examples include optimising supply chains, promoting sustainable manufacturing processes,⁴ as well as improving climate modelling.

PricewaterhouseCoopers UK estimates that using AI for environmental applications could contribute up to USD 5.2 trillion to the global economy in 2030. It also estimates that greenhouse gas emissions could be reduced by 4% in 2030—the equivalent to the 2030 annual emissions of Australia, Canada and Japan combined.⁵

¹ IBM, n.d., *What is artificial intelligence (AI)?*

² Center for Sustainability and Excellence, 2023, *AI applications: panacea or threat to sustainable development and ESG assessments?*

³ UBS, 2023, *ESG Investing Op Ed – Is AI the next frontier in fighting climate change?*

⁴ United Nations, 2023, *How AI helps combat climate change.*

⁵ PricewaterhouseCoopers UK, n.d., *How AI can enable a sustainable future.*

Improving social equity

On the social front, there are significant productivity gains to be made by adopting AI. A recent study by the National Bureau of Economic Research concluded that “AI assistance improves customer sentiment, reduces requests for managerial intervention, and improves employee retention”.⁶ Generative AI tools can also be used by the public to broaden knowledge across a vast swathe of topics, providing potential benefits to society. UBS writes that generative AI could also be used in the medical field, potentially reducing workloads for medical professionals, while providing the broader public with greater access to free or inexpensive medical advice.⁷

AI is being embraced in Australia

In Australia, the use of AI in tackling sustainability challenges is being increasingly embraced by companies. In 2022, Australia’s governmental research arm, the Commonwealth Science and Industrial Research Organization (CSIRO), and Google announced a partnership to use AI to better analyse and manage blue carbon ecosystems. More recently, CSIRO has collaborated with CoreLogic, a property data provider in Australia, to build a tool that calculates the energy efficiency of residential houses. AI has also been deployed in Australia to help farmers analyse climatic conditions to increase yield and profitability, and to monitor if companies are adhering to their emission reduction targets.⁸

But it comes with risks

As AI continues to gain prominence, experts are raising concern about the risks it brings with it. According to research conducted by Vinuesa et al, while AI may act as an enabler on 134 targets across all Sustainable Development Goals, 59 targets may experience a negative impact from the development of AI.⁹

To that end, debate has intensified over whether AI truly has the potential to facilitate development or whether it is more likely to perpetuate inequality.

Commonly cited risks include the environmental impact of energy-intensive AI systems, cybersecurity threats, structural job losses, as well as the potential for reputational damage, political risk, and market disruptions from inaccurate information.

What's a blue carbon ecosystem?

Blue carbon refers to carbon dioxide that is absorbed from the atmosphere and stored in coastal and marine ecosystems. Blue carbon ecosystems can be considered a nature-based solution for tackling the rise in carbon emissions.

If degraded or lost, blue carbon ecosystems have the potential to release carbon back into the atmosphere. Not only is protection and restoration good for the climate, but it also has the potential to create jobs and support economic growth.

Source: Ocean Generation, 2023, *Why protect blue carbon ecosystems?*

Environmental impact

While AI can be used as part of sustainability efforts, the computation required to train AI models incurs a huge amount of energy. This, in turn, comes at an environmental cost. Globally, the carbon footprint for data centres is estimated to be more than 2% of global carbon emissions. This number is expected to rise to 3.2% by 2025 and 14% by 2040.¹⁰ And research firm Gartner Inc has forecasted that “by 2025, without sustainable AI practices, AI will consume more energy than the human workforce, significantly offsetting carbon-zero gains”.¹¹

Cybersecurity risks

While generative AI can provide support for cybersecurity programmes by simulating attacks and providing threat intelligence, it can also be used by criminals for malicious purposes. This includes creating malware, personalised phishing attacks, and spreading misinformation.

Structural job losses

In its *Future of jobs report 2023*, the World Economic Forum predicted that up to 26 million jobs worldwide could be lost to digitalisation and automation. This is in the context of a total of 83 million jobs that it expects to be lost over the next five years versus jobs growth of 69 million.¹² According to Accenture, 40% of all working hours could be impacted by AI¹³, and UBS writes that significant structural job losses could put considerable strain on governments, given their requirement to financially support under- and unemployed people.¹⁴

⁶ Brynjolfsson, E Li, D Raymond, L 2023, *Generative AI at work*, Cornell University.

^{7,14,15} UBS, 2023, *ESG Investing Op Ed – Generative AI: Tread carefully*.

⁸ UBS, 2023, *ESG Investing Op Ed – Is AI the next frontier in fighting climate change?*

⁹ Vinuesa, R et al, 2020, *The role of artificial intelligence in achieving the Sustainable Development Goals*, Nature.

¹⁰ Soon, O, Hui, L, 2022, *Sustainability applications for artificial intelligence*, Sustainability.

¹¹ Gartner Inc, 2022, *Gartner unveils top predictions for IT organizations and users in 2023 and beyond*.

¹² World Economic Forum 2023, *Future of jobs report 2023*.

¹³ Accenture, 2023, *Accenture to invest \$3 billion in AI to accelerate clients’ reinvention*.

Market disruption

UBS sees several uses of generative AI potentially causing significant market disruption. "Deepfake" videos and audio content could purport to feature regulators, company representatives, or politicians, in contexts that could move markets.¹⁵

What's a deepfake?

Deepfake technology uses machine learning algorithms to create realistic-looking fake videos, images, or audio. Typically, deepfakes are used to purposefully spread false information.

A more sustainable trajectory

To tackle the environmental impact of AI, Marr suggests that companies can reduce their carbon footprints by storing data in more carbon-friendly regions of the world, such as data centres that run on hydroelectricity.¹⁶ And Google has identified four best practices, known as the "4Ms" that can reduce energy and carbon emissions for anyone using Google Cloud services. These include selecting efficient machine learning model architectures, and computing in the cloud rather than on-premise. As much of the energy usage by AI models occurs during the 'training' phase, scientists are looking at ways to reduce the need for huge amounts of training data, which should translate into energy savings.¹⁷

Increased oversight

While AI remains largely unregulated, the US and the European Union (EU) are drawing up new regulations. The US has provided a *Blueprint for an AI Bill of Rights*, and the EU has proposed an *Artificial Intelligence Act*. In October 2023, the United Nations Secretary-General announced the creation of a new AI advisory board on risks, opportunities and international governance of AI. This body will support the international community's efforts to govern AI.¹⁸ And in Australia, the Government is seeking consultation on the appropriate regulatory and policy response to support safe and responsible AI practices.¹⁹

What does this mean for investors?

While certain sectors are likely to see an increase in revenue and decrease in costs as a result of AI, it is probable that many firms will also experience disruption as AI matures and adoption grows. Importantly, positive outcomes as a result of AI cannot be expected on their own. Decision-makers and governments need to use the outputs from AI and make the necessary changes to reap the benefits.

In *Will generative AI deliver a generational transformation?*, published in May 2023,²⁰ UBS predicts that the following sectors and sub-sectors will see an increase in revenue and reduction in costs due to generative AI:

Real estate, mining, capital goods, telecoms, food retail, semis, general retail, luxury goods, tech hardware and medical devices.

The following sectors and sub-sectors are also likely to benefit from rising revenue and cost savings, but will also likely be impacted by competition risk:

Software, media, chemicals, oil and gas, aerospace/defence, stock exchanges, and staples.

Written by Kay Byrne, Investments, Product and Services

To read more of our insights, visit lgtcrestone.com.au



¹⁶ Marr, B 2023, *Green intelligence: Why data and AI must become more sustainable*, Forbes.

¹⁷ Soon, O, Hui, L, 2022, *Sustainability applications for artificial intelligence*, Sustainability.

¹⁸ United Nations, 2023, *Secretary-General announces creation of new artificial intelligence advisory board*.

¹⁹ Australian Government, Department of Industry, 2023, Science and Resources, *Supporting responsible AI: Discussion paper*.

²⁰ UBS, 2023, *Q-Series – Will generative AI deliver a generational transformation?*

Contact us

LGT Crestone Wealth Management Limited

ABN 50 005 311 937
AFS Licence No. 231127

info@lgtcrestone.com.au
lgtcrestone.com.au

Important note

This document has been prepared by LGT Crestone Wealth Management Limited (ABN 50 005 311 937, AFS Licence No. 231127) (LGT Crestone Wealth Management). The information contained in this document is of a general nature and is provided for information purposes only. It is not intended to constitute advice, nor to influence a person in making a decision in relation to any financial product. To the extent that advice is provided in this document, it is general advice only and has been prepared without taking into account your objectives, financial situation or needs (your Personal Circumstances). Before acting on any such general advice, we recommend that you obtain professional advice and consider the appropriateness of the advice having regard to your Personal Circumstances. If the advice relates to the acquisition, or possible acquisition of a financial product, you should obtain and consider a Product Disclosure Statement (PDS) or other disclosure document relating to the financial product before making any decision about whether to acquire it.

Although the information and opinions contained in this document are based on sources we believe to be reliable, to the extent permitted by law, LGT Crestone Wealth Management and its associated entities do not warrant, represent or guarantee, expressly or impliedly, that the information contained in this document is accurate, complete, reliable or current. The information is subject to change without notice and we are under no obligation to update it. Past performance is not a reliable indicator of future performance. If you intend to rely on the information, you should independently verify and assess the accuracy and completeness and obtain professional advice regarding its suitability for your Personal Circumstances.

LGT Crestone Wealth Management, its associated entities, and any of its or their officers, employees and agents (LGT Crestone Group) may receive commissions and distribution fees relating to any financial products referred to in this document. The LGT Crestone Group may also hold, or have held, interests in any such financial products and may at any time make purchases or sales in them as principal or agent. The LGT Crestone Group may have, or may have had in the past, a relationship with the issuers of financial products referred to in this document. To the extent possible, the LGT Crestone Group accepts no liability for any loss or damage relating to any use or reliance on the information in this document.

This document has been authorised for distribution in Australia only. It is intended for the use of LGT Crestone Wealth Management clients and may not be distributed or reproduced without consent. © LGT Crestone Wealth Management Limited 2024.