# Emerging technologies transform climate action with blockchain, AI, quantum computing and robotics



Emerging technologies are being increasingly recognised for their potential to address climate change, which is one of the most pressing challenges faced by humanity. While the initial development of technologies such as blockchain, artificial intelligence (AI), quantum computing, robotics, and extended reality was not specifically aimed at environmental sustainability, they are now being harnessed to make significant impacts on global environmental initiatives.

Blockchain technology, introduced in 2008 by an unknown entity under the name of Satoshi Nakamoto, functions as a secure and decentralised digital ledger. It allows for the secure recording and verification of transactions without the need for intermediaries, such as banks. This feature is particularly beneficial in establishing transparent and efficient carbon markets, facilitating the trading of carbon credits. Traditional markets often suffer from issues like fraud and inefficiency, but blockchain's secure recording capabilities enhance confidence among participants. Companies like Toucan Protocol and AirCarbon Exchange are leading the way in this innovation by providing platforms for trading tokenised carbon credits while ensuring traceable transactions.

Moreover, blockchain technology enables peer-to-peer renewable energy trading. For instance, homeowners with solar panels can sell surplus energy to neighbours, fostering a market that encourages the utilisation of renewable sources. Australian company Power Ledger has pioneered a blockchain-based energy trading platform that facilitates honest and secure transactions.

Another key application of blockchain is in enhancing supply chain transparency for sustainable products. Companies can use this technology to track products' journeys from raw materials to consumers, thereby verifying their sustainability claims. Unilever, for example, employs blockchain to ensure its palm oil supply chain is free from deforestation.

AI has also emerged as a transformative force in the fight against climate change. Utilising algorithms to perform complex tasks, AI optimises energy systems, enhances climate modelling, and supports sustainable agricultural practices. Energy systems powered by AI can dynamically adjust to real-time conditions, managing energy distribution more efficiently.

Furthermore, AI plays a vital role in predicting climate trends by analysing extensive datasets, including satellite images and historical data. These insights can lead to more effective environmental interventions and highlight localized climate impacts. For sustainable agriculture, AI supports precision farming techniques that monitor crop health and resource use, subsequently improving yields while minimising resource waste.

Quantum computing stands out as a revolutionary advancement that holds potential for accelerated climate solutions. By harnessing the principles of quantum physics, this technology promises enhanced computational capabilities to model complex climate systems more accurately. Google’s Willow quantum chip exemplifies these advancements, enabling solutions to be developed for carbon capture and energy materials.

In the realm of robotics, advancements merged with AI facilitate the installation and maintenance of renewable energy systems and improve agricultural efficiency. Robots are being utilised to install solar panels in hazardous environments, reducing human exposure to danger, while drones assist in monitoring crops and identifying disease. Robotics also plays a pivotal role in waste management by improving the efficiency of sorting recyclables, as evidenced by San Francisco’s collaboration with Recology to automate sorting processes.

The potential of these emerging technologies extends through various sectors, and their integration into climate action strategies signifies a transformative movement toward sustainability. As new challenges arise from the ongoing climate crisis, the application of innovative technologies may yield practical solutions that could redefine humanity’s approach to environmental stewardship.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.axios.com/2019/03/19/blockchain-could-help-track-progress-on-paris-agreement-goals> - This article discusses how blockchain technology can aid in tracking progress towards the Paris Agreement goals by providing a decentralized and transparent system to verify and monitor carbon emission reduction strategies.
2. <https://www.axios.com/2018/07/18/how-blockchain-is-transforming-energy-systems> - This piece highlights the potential of blockchain to transform energy systems, including applications in energy trading platforms and carbon production registries, thereby enhancing efficiency and profitability in the energy sector.
3. <https://www.ft.com/content/33ed8ad0-f8ad-42ed-983a-54d5b9eb2d27> - This report explores how next-generation artificial intelligence (AI) can be harnessed to foster societal improvements, with a focus on agriculture, healthcare, and environmental conservation, including mitigating climate change effects and enhancing agricultural yields.
4. <https://www.reuters.com/sustainability/land-use-biodiversity/comment-how-empowering-smallholder-farmers-with-ai-tools-can-bolster-global-food-2025-01-10/> - This article discusses how AI-powered tools, such as advanced weather forecasting, are helping smallholder farmers in rural India achieve significant advances in climate resilience, leading to reduced debts and increased savings.
5. <https://www.axios.com/2019/03/19/blockchain-could-help-track-progress-on-paris-agreement-goals> - This article discusses how blockchain technology can aid in tracking progress towards the Paris Agreement goals by providing a decentralized and transparent system to verify and monitor carbon emission reduction strategies.
6. <https://www.axios.com/2018/07/18/how-blockchain-is-transforming-energy-systems> - This piece highlights the potential of blockchain to transform energy systems, including applications in energy trading platforms and carbon production registries, thereby enhancing efficiency and profitability in the energy sector.
7. <https://news.google.com/rss/articles/CBMinwFBVV95cUxNMXh5YXBndlB2eEVXS2Vacl9neGhxTUdHVFFRbnNkcTBRVmI4LTV3OGFQVllHUGtLcGtqOTBhV0tBUFFYRmtCNkhjV0FXM1hCTnYxVFBIejFhSTExYUsxZU0tT09fdExxLWJ6dm5Fd3liVGF2bDlJOUtudzZGWTU5S3ZEZ1dGcy1sQVVkcUx1VVhCeTRqUlVseXlEaC1PcGs?oc=5&hl=en-US&gl=US&ceid=US:en> - Please view link - unable to able to access data