3 ways AI is helping the planet

by Vanessa Ho

Schools in sunny Georgia were having the same problem as furniture shops in snowy Minnesota. When the weather turned hot or cold, they basically had one option to make indoor air comfortable: block outside air and blast the heater or air conditioner, both of which were energy hogs.

But AI-powered tools are now helping them automate energy-saving strategies like integrating fresh air and reducing air flow to empty rooms.

"We've taken the complexity of building management — tracking real-time weather, occupancy, air quality and equipment performance — and created a smart energy autopilot that works for buildings of any size and is easy to use," says Dave Koerner, vice president of global marketing for 75F.

The company's tools are part of a new generation of AI technologies designed to help people save energy and costs, which can help reduce greenhouse gas emissions and improve climate resilience.

"The world needs to pivot toward a more sustainable future at a pace and scale never seen before," says Amy Luers, senior global director for Sustainability Science and Innovation at Microsoft. "AI can play a critical role in driving that pace and scale, helping to reduce global emissions and achieve net zero more quickly."

Datacenters that power AI consume resources like energy and water, contributing to less than 1% of the world's greenhouse gas emissions, according to the International Energy Agency. But the growth in AI and datacenters in some regions can stress local energy grids and water systems. And datacenters, along with the world, need to continue advancing sustainability progress.

That's why Microsoft is working to make datacenters and AI systems more energy- and water-efficient It's also using carbon-free energy and enhancing access to it, while

reducing water losses in water-stressed regions and supporting local communities. AI can help accelerate this work.

“It’s impossible to predict exactly how AI will affect sustainability progress in the long run, but we know it has three abilities that can be game-changers in helping society overcome hurdles in the journey to net-zero greenhouse gas emissions,” Luers says. “We just need to put these abilities to work.”

Here are three ways AI is helping the planet.

AI's analytical power is becoming indispensable in tackling climate challenges that require a grasp of complex systems like supply chains, electricity grids and atmospheric sciences. Its ability to detect patterns and predict outcomes in large datasets can lead to things like more accurate weather forecasts, reduction in water and methane leaks, and more resilient electricity grids with enhanced transmission capacity.

For 75F, AI is powering tools that help schools, stores and offices manage complex heating, ventilation and air conditioning (HVAC) systems. Machine learning analyzes weather, building use and sensor data to automatically adjust settings for energy savings and comfort.

The tools have helped 75F's customers save 42% in HVAC energy use in thousands of buildings worldwide, based on customer utility data and a three-year study by the National Renewable Energy Laboratory. The energy savings have led to less greenhouse gas emissions. Powered by Azure AI, the technology is partially supported by a Microsoft grant to Breakthrough Energy Catalyst, a program that invests in new climate-related technologies.

"What we hear most often from customers is, 'I'm worried about messing something up,' because they're intimidated by their building management system," Koerner says. "We've designed an end-to-end solution around AI that removes the complexity between humans and the system to help them save energy and costs."

AI is helping researchers speed up development of new sustainability solutions, an often slow and expensive process. The recent discovery of a new battery material that uses less

lithium showed the power of AI and high-performance computing to compress research and development — work that can take years — into a few weeks. The extraction of lithium and its use in batteries have significant environmental and safety impacts.

AI is transforming material sciences in work that's helping to lower renewable energy costs, enhance carbon removal and reduce embodied carbon in concrete and steel. Embodied carbon is the greenhouse gas emissions generated when materials are made, installed, maintained and discarded.

To advance low-carbon and carbon-absorbing materials, the nonprofit climate technology investor Elemental Impact recently hosted a pitch challenge for solutions that drew AI experts from around the world. Winners will receive funded pilots, equity investment and other prizes.

“We’re seeing firsthand how AI can embolden technologies and innovations essential to building materials,” says Avra van der Zee, chief operating officer at Elemental Impact. “We’re thrilled to create more opportunities connecting these promising solutions to the capital and customers they need to scale.”

Submissions to the challenge include an AI platform that analyzes millions of concrete mixes to help customers choose a mix optimized for cost, carbon reduction and performance. Other applicants are using AI to research new methods to reduce emissions in steelmaking and best ways to add carbon-negative biomass to industrial materials.

Elemental Impact led the challenge with French engineering group Bouygues, French IT and consulting company Capgemini, and Microsoft's Climate Innovation Fund, a $1 billion initiative for scaling emerging climate technologies.

"AI can accelerate materials innovation," says James Lockyer, the Climate Innovation Fund's portfolio management director. "We're focused on the opportunity to support new ways of reducing carbon emissions across the entire materials value chain."

Employers and educators are using AI to help build a sustainability workforce needed for faster progress on climate goals. Climate-related jobs in sectors like renewable energy, electric vehicles and carbon accounting have grown, but the number of qualified workers has lagged behind, according to a 2024 Global Green Skills Report by LinkedIn.

Luers says AI has the potential to bridge the skills gap through training and information tools customized for specific industries and skill levels. Microsoft is developing AI-enabled tools for farmers, including a chatbot that provides personalized, reliable and contextually relevant advice. Other AI experts are building tools that can help people find and learn sustainability information more quickly.

“AI can play a transformative role,” says Luers. “For example, AI-powered learning platforms can analyze someone’s existing skills, identify gaps and recommend a tailored learning path.”

To expand the pool of sustainability experts skilled in AI, Microsoft is helping people learn foundational AI skills through its educational platform LinkedIn Learning. It also launched a Green Digital Skills certificate program with job training organization INCO Academy that has attracted 30,000 people in 140 countries.

The work is part of an ongoing effort to help people mitigate climate change in meaningful ways.

“The world needs a workforce that can design and drive progress toward sustainability goals,” Luers says. “AI can help expand and enhance human capacity.”

Learn more about accelerating sustainability with AI.

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AI Technology