

Products & Innovation

Fast Forward
2021 Sustainability Report

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Micron's memory and storage solutions are at the core of countless digital devices. We're constantly innovating to make those solutions faster and more efficient.

Micron's vision is to transform how the world uses information to enrich life *for all*. We are proud to provide solutions that drive performance and access to information technology and to help our customers achieve their goals for benefiting society and the environment.

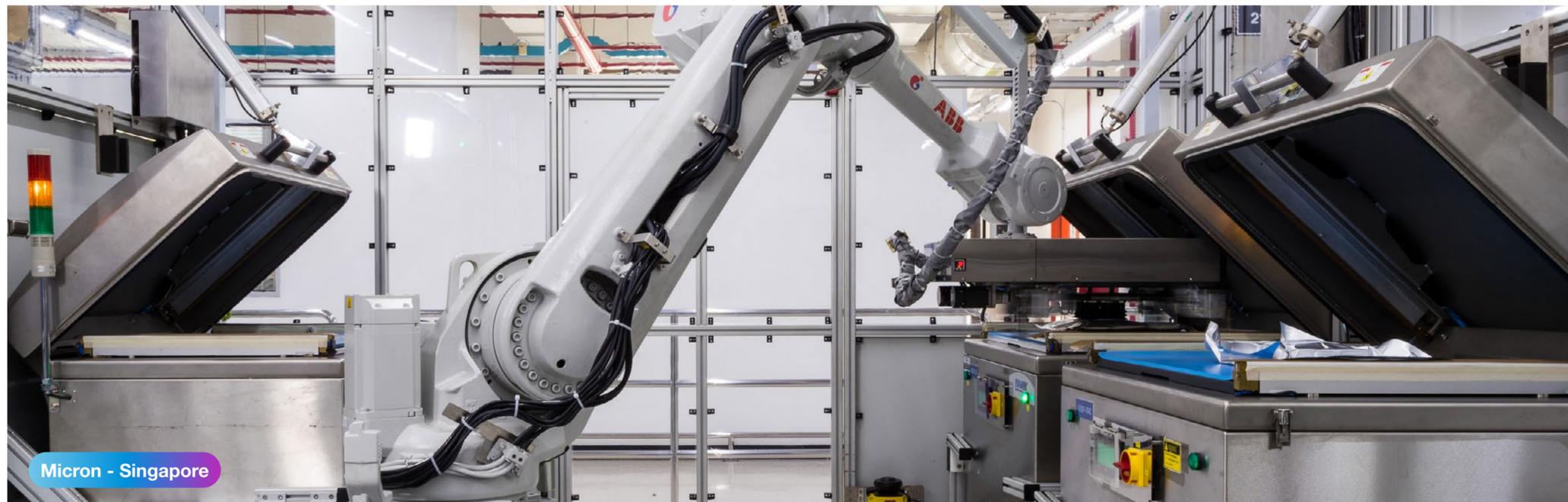
All modern computing hardware depends on shared underlying technology — semiconductor memory and storage — to access and store data. Advancements in memory and storage solutions set the pace for technology development and, therefore, breakthroughs that improve our way of life. A new generation of technologies, including artificial intelligence (AI), precision medicine, the internet of things (IoT), autonomous vehicles and cloud computing,

could further expand what's possible for society and our planet. As innovations like these enter the mainstream and demands for memory and storage increase, the need to analyze, access and act on data grows.

By enabling rapid advancements in memory and storage, Micron is helping unlock the innovations that will make a better future possible. Micron delivers a rich portfolio of high-performance DRAM, NAND, NOR, high-bandwidth memory and multichip package solutions, and we work closely with customers to create specialized memory and storage architectures. As a leader in the semiconductor industry for more than 40 years, we have taken part in every stage of these vital technologies' evolution.

Memory and storage affect the sustainability of a variety of end products, from computer energy use to vehicle safety and even the efficiency of our own manufacturing facilities. This influence is why we strive to consistently improve performance, investing in research to deliver higher capacity, greater security, faster data transfer rates, lower power consumption, increased energy and material efficiency, and improved reliability. Through supplier engagement, technology development and legal compliance, we evaluate new materials to ensure the safety of our team members and our products.

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Innovative Product Applications

Through Micron's deep learning accelerator (DLA) program, we are partnering with customers on AI applications that will create the technological capabilities of the future.

A significant part of the DLA effort involves eliminating wasteful and unnecessary data movement between processor and memory. This streamlining ensures that advanced computations are not only faster but also more energy-efficient. Our collaborations with others are enabling autonomous vehicles to operate more intelligently, sparking discovery in science and medicine and helping communities address basic human needs. Here are a few ways that the DLA is working with partners to accelerate sustainability and social good.

Engaging With Customers for Vehicle Safety

Autonomous vehicles (AVs) will revolutionize road safety, dramatically reducing the thousands of crashes caused by human error each year. They will also be the ultimate "intelligent edge" devices, collecting enormous amounts of data that must be converted into decisions in real time. Micron's technology is key to making AVs viable stand-alone devices, where all processing is done within the vehicle. Together with Continental AG, we are using neural network models to predict pedestrian behavior. The neural network also monitors a vehicle's driver and other occupants to track alertness and attention so that AVs can operate more safely.

Accelerating Precision Oncology

Precision oncology, an emerging approach in cancer care, involves tailoring treatments for individual patients and tumor types. The process requires measuring, visualizing

and integrating various levels of clinical information, from symptom expression all the way down to tumor-level DNA. This generates many terabytes of data that are highly complex and time-consuming to process.

Our DLA, in conjunction with the Oregon Health & Science University (OHSU), is a mix of AI hardware, software and advanced memory that allows researchers to process entire high-resolution tumor images in a time frame that is clinically relevant. The team's three priorities are optimizing neural network performance, speeding up data analysis and using Micron's advanced memory solutions to improve image analysis and processing. In 2020, the team focused on applying insights extracted from tumor images. Next, the team will look at additional imaging modalities and automated analytics.

Advancing Basic Human Needs

Since 2019, Micron has teamed up with Water.org in a unique partnership that combines our philanthropic efforts with our technological expertise. Water.org partners with microfinance institutions to provide small loans to help people put water and sanitation solutions like taps and toilets in their homes. Once people no longer have to spend long hours fetching water, they can seek employment outside the home, pursue education and keep their families safe and healthy. Repaid loans are then lent to the next family in need.

To help incentivize microfinance institutions to increase water and sanitation lending, Micron developed a neural network architecture to identify the characteristics of a successful portfolio. This solution is expected to be tested and deployed in 2021, allowing Water.org to combine human intuition with intelligent software for better decision-making. In addition to the technology solution, the partnership has reached 10,000 people with life-changing access to safe water and sanitation.

Addressing AI Challenges Head-On

AI solutions like those developed by Micron's DLAs can do good. But in the wrong hands, they can also be used in illegal, unethical or discriminatory ways. Micron is committed to participating in continuing conversations about ethics in AI. Micron has taken part in both governmental and private roundtables including the AI for Good Global Summit, the United Nations' platform for this topic.



Product Efficiency

Micron's industry-leading products mitigate the growing energy demands of IT while enabling technologies that increase the efficiency of infrastructure and industrial processes.

More than half a century ago, Gordon Moore predicted that the number of transistors possible on a silicon chip would double every year. While Moore's law has been modified, questioned and declared dead multiple times over the years, Micron continues to drive rapid improvements in the power requirements, performance and area of each successive generation of chips.

These advancements help Micron meet the power requirements of AI, the IoT, our cloud computing customers and the world at large. Efficiency is both an important performance requirement — to improve battery life and reduce heat output, for example — and a means of addressing the environmental impacts of IT use. Data centers alone use about [1% of global electricity](#), much of which comes from fossil fuel sources contributing to climate change. With IT use projected to grow significantly in the coming years, product efficiency will play an important role in Micron's efforts to address the influence of technology on the environment.

For example, we are working to make each generation of our memory solutions for data center servers do more with less energy per bit. Transitioning from DDR4 to DDR5 products, which will take place over the next few years, is expected to reduce DRAM power consumption by approximately 14%, lowering costs for data center customers. Similarly, as the need for greater computing and data-processing capabilities on handheld devices grows, these devices cannot trade

energy efficiency for performance. In early 2021, Micron introduced 1α (1alpha) node LPDRAM products, which are up to 15% more power-efficient than previous generations, allowing 5G mobile users to perform more tasks on their smartphones without sacrificing battery life.

We collaborate with customers to deliver memory and storage solutions that meet increased expectations for energy efficiency. Micron's [system power calculators](#) are online tools that allow customers to estimate memory power use when they make system architecture and design decisions.

Micron's products also enable automation and efficiency across sectors, from industrial applications to transportation. Micron's industrial memory solutions, including embedded AI accelerators and local storage, make it possible for industrial IoT (IIoT) edge infrastructure to collect, process and share data that increases energy efficiency and reduces waste.

We have seen these results in our own operations, where we collect petabytes of data to drive real-time performance monitoring, significantly improving labor productivity and production efficiency.

In addition, AVs need our DRAM products to provide data quickly for real-time processing, allowing these vehicles to be safer and more efficient. At the same time, our products support the networks facilitating the smooth flow of the entire vehicle transportation system. Our solid-state drives provide the storage for map data, image data, sensor readings, program code, and data being generated at a rate of 5 gigabytes each second.



Micron - Taichung City, Taiwan

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Micron is investing in new machine learning and AI technologies to improve manufacturing and production efficiencies. With an advanced neural network, our AI team is able to prevent manufacturing challenges that might cause productivity, materials and energy losses.”

Eugenio Culurciello
Fellow and Machine Intelligence Technology
Group Leader, Compute and Networking Business
Unit's Advanced Computing Solutions

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Data Protection & User Privacy

We work closely with our customers to understand their needs related to cybersecurity, data protection and product safety, while also looking at industry trends and potential vulnerabilities.

Specific areas of growing risk and vulnerability are the internet of things and industrial internet of things. What began as a means of machine-to-machine communication has evolved into a complex system of millions of connected devices worldwide, each of which represents a possible attack point within a network.

As a result of IoT growth, Micron's innovation today focuses not only on storage solutions for vast amounts of new data but also on security for these IoT devices. The threat of enterprise cyberattacks is far-reaching, given the potential vulnerability and proliferation of embedded systems — which are found in everything from automated equipment in factories to automobiles and to smart home devices.

As everyday smart devices become targeted network entry points for cybercriminals, Micron's Authentia™ technology provides an extra layer of defense without adding new components to an IoT platform. In addition, Authentia memory components include cryptographic verification, addressing growing concerns about counterfeiting or tampering with electronics components. Almost all IoT devices contain flash memory chips, and Authentia works by protecting the software and data that run from those chips. Imagine a typical house: If attackers can unlock the front door, they gain access to everything inside. Authentia acts

like additional keys that lock not only the front door but every room within, providing an extra level of protection.

This unique security solution increases Micron's value as a memory provider for IoT and connected devices across the automotive, industrial and consumer markets. Micron's companion Authentia Key Management Service is a security-as-a-service platform that enables cloud activation and identity verification of installed Authentia flash devices and their platform software content at the edge. This capability offers platform-level hardening and additional device protection for our customer solutions.

Technologies like Authentia build on Micron's market and industry leadership. We are an active member of the Trusted Computing Group, an industry standards body that develops and maintains the open standards and specifications for self-encrypting drives (SEDs) and other trusted devices. A decade ago, we launched one of the industry's first solid-state SEDs intended for mobile computing and have since developed drives that meet the rigorous Federal Information Processing Standards. With safeguards like these, we help ensure that the theft of a person's device does not necessarily mean theft of that person's data.

Automotive Safety

The assurance provided by memory and storage products can't stop with IT and operational technology security. Some technology applications require remarkably stable, reliable hardware to protect users. This need is particularly true in the automotive sector, where driver and pedestrian safety is critical and where memory and storage solutions are vital to enabling safe and efficient connected, autonomous and electric vehicles. Micron has become the industry leader in automotive memory and storage by helping leading brands and tier 1 suppliers in their functional

safety efforts. In addition to our work with Continental AG on the DLA applications noted above, Micron has made other investments:

- Creating dedicated and experienced teams, such as a functional safety office staffed with industry safety veterans and safety experts, including system architects and applications engineers for collaboration support.
- Adopting processes and methodologies across Micron on the journey to comply with the ISO 26262 standard for the functional safety of road vehicles. These activities include supplier-performed hardware evaluation reports and the industry's first independent assessment that Micron's automotive LPDDR5 is suitable for safety systems up to ASIL-D, the highest level applied to safety assurance.
- Conducting extensive functional safety analysis and providing collateral to simplify customer analysis.



Product & Trade Compliance

We focus on addressing risks that products may pose to customers, the environment or society.

Controlling Restricted Substances

Micron uses a range of potentially hazardous chemicals and materials to transform wafers into individual die and ensure product performance during use. These materials are carefully regulated in many parts of the world.

In addition to ensuring the safety of our people and processes, our environmental, health and safety (EHS), product compliance and global procurement functions work together to ensure that Micron products and processes meet legal and customer product-compliance requirements. These include the European Union directive on the Restriction of the Use of Certain Hazardous Substances (RoHS), the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and other lists of banned or restricted substances.

We also closely track substances that might be restricted in the future. In the past decade, there has been a regulatory shift from managing select hazardous chemicals to managing classes of chemicals and their associated hazards. As a result, Micron has teams of chemical engineers in the U.S. and Asia dedicated to studying the structural functional relationship of chemicals and their associated regulatory environments. This research allows us to identify emerging chemicals of concern and work to remove these chemicals from substances and materials before they are listed by customers or regulators. Being proactive in our regulatory monitoring, product compliance, and validation and certification processes allows us to deliver new products quickly while ensuring proper restricted substance control and conformance with requirements.

Supplier engagement is also important in managing restricted substances. Micron communicates our chemical-use expectations and restrictions to suppliers biannually while training them to maintain programs on restricted substance control. Supplier programs include regulatory monitoring, chemical hazard assessment and substance inventory monitoring. For suppliers who do not have all the program elements, we provide support to help them improve. Relevant suppliers are subject to risk assessment and auditing of their restricted substance control processes.

When new substances are added to regulatory lists, our procurement team communicates new requirements throughout our supply chain and reminds suppliers of Micron's expectations and applicable documentation. In these instances, we require a prompt response from each supplier regarding its use of any listed substances. We also expect suppliers to monitor the candidate list for potential inclusions in the REACH regulation and other applicable requirements. When necessary, article suppliers must submit necessary information to the Substance of Concern in Products (SCIP) database.

Complying With Global Trade Laws & Regulations

As a responsible citizen in the global marketplace, Micron is committed to adhering to all laws and regulations that relate to export controls and trade compliance. Micron requires its team members and representatives to conduct business with the highest possible vigilance. We also mandate compliance with export controls, import controls and customs, economic sanctions and embargoes, and anti-boycott laws and regulations.

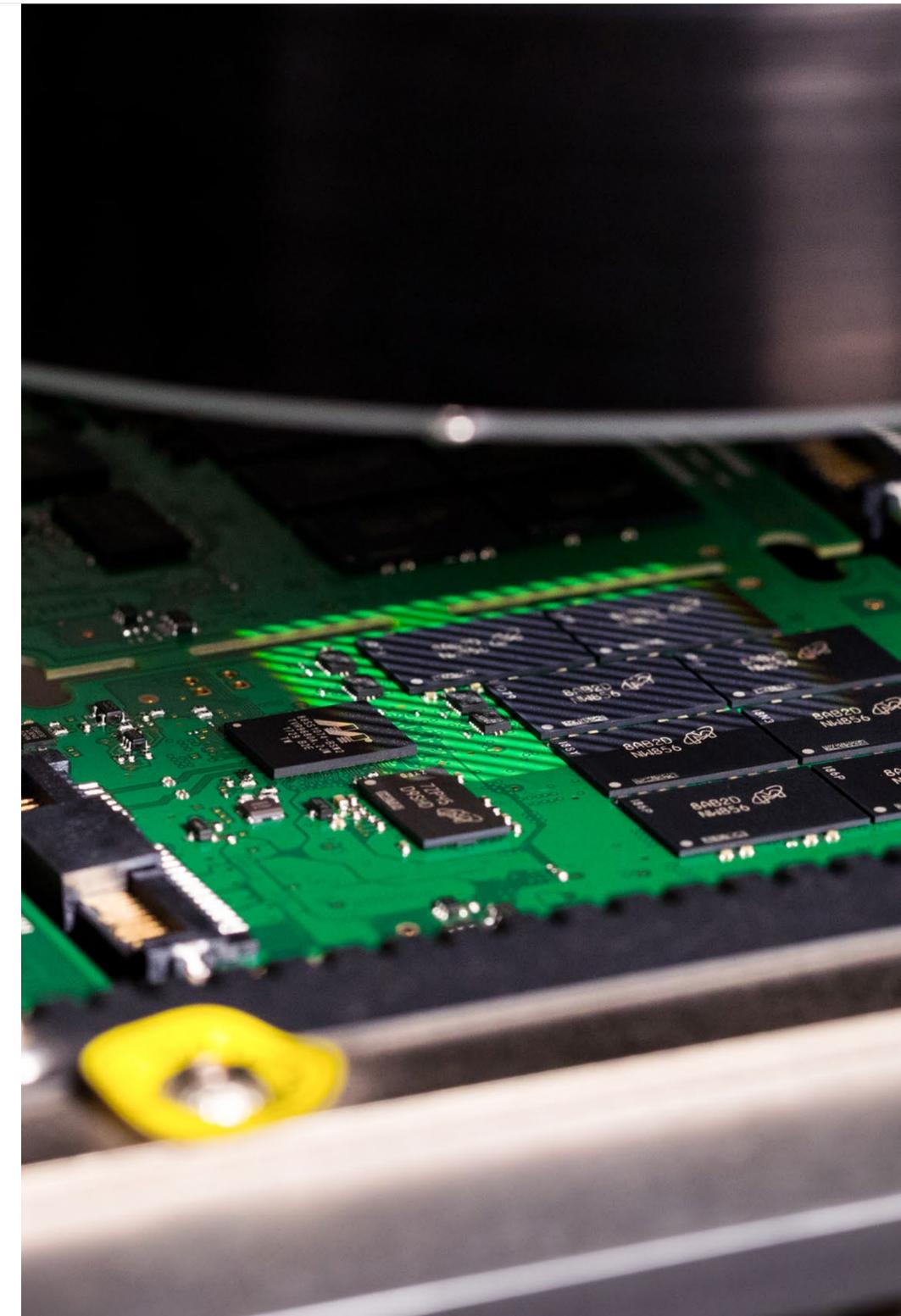
To achieve these objectives, Micron's trade compliance program includes the following:

- The commitment and support of our leadership for implementing and executing a robust compliance program

- Policies and protocols to ensure team members and management are informed and trained on the latest applicable trade compliance regulations
- Risk assessments and oversight to consistently evaluate and strengthen our compliance posture
- Internal systems and processes to effectively manage international operations, personnel and third-party relationships
- Protocols for adequate compliance recordkeeping and reporting
- Internal reporting channels and corrective action plans for suspected violations

Adhering to trade compliance laws and regulations is vital for protecting the safety and security of the countries in which Micron operates and for keeping our products, technology and software out of the hands of people and organizations that seek to do harm.

As a global company, Micron's commitment to trade compliance initiatives ensures seamless support for our major objectives, achievement of our key business strategies and delivery of excellence for our customers. In 2020, our compliance team responded quickly to fully comply with evolving export control laws resulting from rapid and dynamic changes in U.S.-China trade policy.





Published in April 2021, this report covers the sustainability performance of Micron Technology, Inc., in fiscal year 2020 (Aug. 30, 2019, through Sept. 3, 2020), unless otherwise stated, and includes all of Micron's controlled entities. This 2021 Sustainability Report has been prepared in accordance with Global Reporting Initiative (GRI) Standards: Core option. GRI is the most widely accepted global standard for sustainability reporting and allows companies to measure, evaluate and communicate corporate sustainability information in a consistent and comparable manner. We are also reporting to the Sustainability Accounting Standards Board (SASB) Semiconductors Standard and provide an index aligned with the Task Force on Climate-Related Financial Disclosures (TCFD) framework.

Accompanying this report is our 2021 Sustainability Progress Summary, which contains selected highlights from the past year and stories of how Micron and our team members have taken action to meet urgent global challenges, such as COVID-19, inequality and climate change.

About Micron Technology, Inc.

We are an industry leader in innovative memory and storage solutions transforming how the world uses information to enrich life for all. With a relentless focus on our customers, technology leadership, and manufacturing and operational excellence, Micron delivers a rich portfolio of high-performance DRAM, NAND and NOR memory and storage products through our Micron® and Crucial® brands. Every day, the innovations that our people create fuel the data economy, enabling advances in artificial intelligence and 5G applications that unleash opportunities — from the data center to the intelligent edge and across the client and mobile user experience. To learn more about Micron Technology, Inc. (Nasdaq: MU), visit micron.com.

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