SEAGATE

eBook

Seagate Drive Circularity for a Sustainable Future

Seagate is working to revolutionize how we consume and dispose of electronic devices by ensuring products have a longer lifespan through repair, refurbishment, component extraction, and material recovery.

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Introduction

Seagate is working to change how electronic devices are consumed and disposed of by extending disk drive life through repair, refurbishment, and material recovery.

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"Extending the lifespan of hard drives through refurbishment saves a staggering 275 times more CO_2 than recycling the components and reduces the number of drives we need to make a year."

-Dave Mosley
Seagate Chief Executive Officer
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Introduction to Seagate's Circularity Program

Embracing Sustainability

Seagate Revolutionizes Data Storage

Seagate, the innovative leader in data storage, has set its sights on revolutionizing the way we consume and dispose of electronic devices. Say goodbye to the old "take-make-waste" model that has wreaked havoc on our environment. Seagate has embraced the circularity movement with open arms, recognizing how unsustainable our current consumption patterns are. With a touch of ingenuity and a dash of determination, Seagate is spearheading positive changes in the circular economy, ensuring that products have a longer lifespan through repair, refurbishment, component extraction, and material recovery.

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"Seagate urges the entire ecosystem of technology stakeholders to come together, innovate, and elevate the industry's overall commitment to sustainability."

-BS Teh
Seagate Chief Commercial Officer and EVP, Sales and Marketing

The Benefits of a Circular Economy

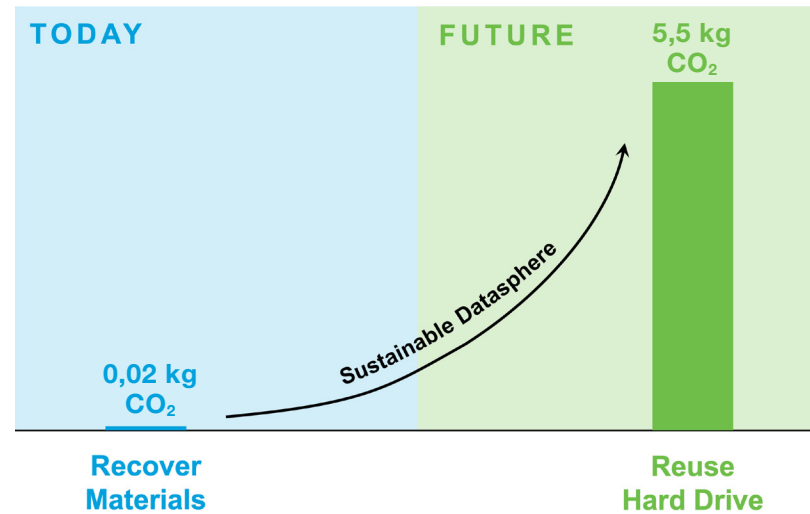# Unlocking Economic Opportunities

The Power of the Circular Economy

The environmental benefits of extending product life are tremendous. Did you know that it saves a staggering 275 times more CO_2 than recycling the components? By refurbishing and reusing hard drives, Seagate significantly reduces electronic waste, contributing to a more sustainable IT ecosystem. The Ellen MacArthur Foundation even estimates that transitioning to a circular economy can generate mind-boggling economic benefits of up to $1.8 trillion by 2030.

Seagate wholeheartedly believes in the positive impact of the circular economy and the potential of giving hard drives and SSDs a second life. The company is fully committed to engaging with industry partners to continue the groundbreaking work it started in 2022. Seagate goes the extra mile to minimize environmental waste caused by its drives and servers. In the fiscal year 2022, over 1.16 million hard drives and SSDs had their lives extended through Seagate's Refurbishment and Circularity Program. These drives were recovered, refurbished, and placed back into the market, effectively avoiding a colossal 540 metric tons of e-waste. It's astonishing to think about how many storage devices are needlessly destroyed when they could be given a new lease on life.

Hard Drive Reuse:

275× Larger Impact than Recycling

TODAY — Recover Materials: 0,02 kg CO_2
FUTURE — Reuse Hard Drive: 5,5 kg CO_2
Sustainable Datasphere

Source: Jin, H., Frost, K., Sousa, I., Ghaderi, H., Bevan, A., Zakotnik, M. and Handwerker, C., 2020. Life cycle assessment of emerging technologies on value recovery from Hard Drives. Resources, Conservation and Recycling, 157, p. 104781.

Circular Drive Initiative and Hardware Reuse

Collaboration for a Greener Future

Seagate Serves as Founding Member of Global Circular Drive Initiative

In 2022, Seagate joined other global leaders in the industries of digital storage, sustainability, and blockchain to tackle the e-waste head-on. Known as the Circular Drive Initiative (CDI), this groundbreaking collaboration promotes and enables the secure reuse of storage hardware. The CDI's objective is to significantly reduce e-waste through cooperation and forward-thinking.

Circular Drive Initiative

Learn more about the Circular Drive Initiative:
Visit www.circulardrives.org

Data Security and Sustainable Data Practices

Protecting Data and the Planet

Seagate's Commitment to Sustainable Data Practices

Seagate is serious about data security and adherence to industry standards. They implement multiple standards, such as IEEE 2883, NIST SP800-88rev1, and ISO/IEC-27040.2015, for data purge and sanitization. With Ontrack providing evidence, Seagate ensures the data processed on its hard disk drives becomes unrecoverable. Seagate self-encrypting drives and instant secure erase (ISE) capabilities play a pivotal role in accomplishing its mission and sustainability goals. With digital data wiping, Seagate can redeploy drives into the market, avoiding shredding and contributing to the growing e-waste problem.

Seagate's commitment to sustainability goes beyond refurbishment and circularity. The company invests significantly in research and development to create breakthrough technologies that maximize the value customers can derive from their data. These innovative technologies also extend the lifecycles of Seagate's products, ensuring better data durability and security. Take for instance Seagate's groundbreaking heat-assisted magnetic recording (HAMR) technology, which leads the industry in achieving mass capacities. By combining HAMR with Autonomous Drive Regeneration (ADR) and Advanced Distributed Autonomic Protection Technology (ADAPT) technologies, Seagate significantly reduces CO_2 emissions per terabyte. This breakthrough technology allows Seagate to embark on a more sustainable and cost-effective data journey alongside its customers.

Extending product life is possible with Seagate game changers ADAPT and ADR technologies. These unique capabilities enable Seagate hard drives and some storage systems to possess self-healing properties.

Ontrack®

ERASURE VERIFICATION CERTIFICATE

Project ID: 6320566 **Organization:** Seagate Technology LLC

Testing Methodology
Ontrack® Erasure Verification Code Review and Media Sampling

Sanitization Method: Seagate Disk Depot v4.0.1

Media Sampled				
Make	Model	Serial No.	Sanitization Type	
Seagate	ST16000NM001G	ZL2CXPY6	ATA Sanitize Overwrite	
Seagate	ST16000NM001G	ZL2CXPW7	ATA Sanitize Overwrite	
Seagate	ST16000NM001G	ZL2CXPVF	ATA Security Erase	
Seagate	ST16000NM001G	ZL2L41YA	ATA Security Erase	

Ontrack® Test Method & Result			
Test	Date	Standard	Result
Software Code Review	4/8/2022	NIST 800-88 r1	Pass
Level 1 Verification	4/8/2022	NIST 800-88 r1	Pass
Level 2 Verification	4/8/2022	NIST 800-88 r1	Pass

This verification validates that this product when used in accordance with the specifications can be used to sanitize data to the NIST 800-88 r1 Purge standard on the sample of devices identified in the claim.

David Logue, Operations Manager
on behalf of Ontrack®

VALIDITY OF CERTIFICATE
This certificate is valid for the version of the application against the media tested.

DISCLAIMER
This information is provided on an 'as is' basis. Ontrack® assumes no direct, indirect or consequential liability to any third party for the information contained in this certificate. This certificate does not constitute a recommendation, endorsement or approval of any kind with respect to any specific product or service.

CONTACT
For further information please contact Ontrack® at 800.872.2599 or email us at support@ontrack.com.

> "Seagate ADAPT and ADR technologies are true game changers. These unique capabilities enable Seagate hard drives and storage systems to possess self-healing properties."

-Rose Hiu
Seagate Vice President, Global Marketing and PR

The longer a drive continues doing its job, the longer it stays out of a landfill. Seagate's commitment to product integrity is a key component of the company's efforts to create a sustainable datasphere. As electronics become the fastest growing domestic waste stream on our planet, ADR plays a crucial role in reducing e-waste.

With larger drives containing more heads and platters, the loss of a single platter surface no longer results in a significant loss of capacity. In the past, replacing an entire 20TB hard drive would have been necessary, but now it's merely 5% of the drive's capacity. By keeping the hard disk drive in place and allowing it to function optimally, Seagate naturally reduces e-waste. It's a powerful solution that helps mitigate the carbon emissions associated with drive life cycles, reducing drive waste with resiliency, and maximizing drive capacity utilization.

Now, more than ever, the entire data management infrastructure of the industry needs to be reevaluated with sustainability in mind. It's time for industry players to take responsibility and embrace measures that promote a sustainable data economy. The Seagate Circularity Program provides the much-needed guarantee that drives can be securely erased, allowing them to be returned to use. The engagement from industry players has already begun, but now it's time to take it to the next level. Seagate urges the entire ecosystem of technology stakeholders to come together, innovate, and elevate the industry's overall commitment to sustainability.

Seagate's Circularity Program is a flagship project that demands attention from global industry leaders. It's time to amplify our efforts and take this initiative to new heights on a global scale. By working hand in hand to craft a sustainable datasphere, we have the power to drive data's potential forward—and with it, the future of humanity. Seagate's commitment to integrity ensures that meaningful and measurable action is taken on climate change, as it strives to create a brighter and more sustainable future. For more information, be sure to dive into the Seagate ESG report highlights.
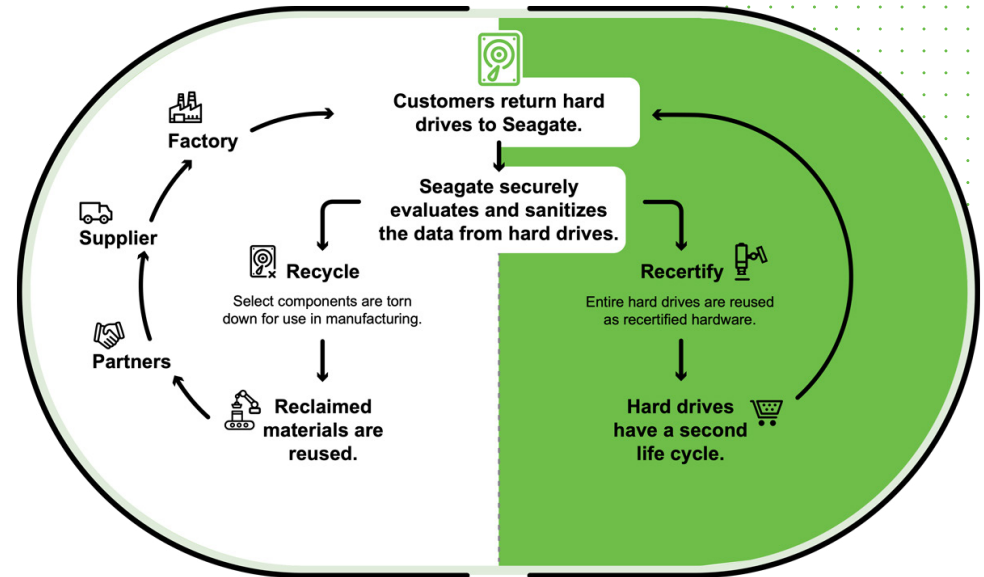
Conclusion

Driving a Sustainable Datasphere

Joining Forces for a Brighter Future

In conclusion, the Seagate Circularity Program is leading the way in revolutionizing the consumption and disposal of electronic storage devices. With its commitment to extending product life, minimizing environmental waste, and driving innovation, Seagate is setting a prime example for the industry. The circular economy is not only environmentally beneficial, but it presents immense economic opportunities. Seagate firmly believes in the positive impact of the circular economy and remains dedicated to engaging industry partners to continue their groundbreaking work. Let's join forces and build a sustainable datasphere together, unlocking the true potential of data and ushering humanity into a brighter future.

Customers return hard drives to Seagate.

Seagate securely evaluates and sanitizes the data from hard drives.

Factory

Supplier

Recycle
Select components are torn down for use in manufacturing.

Partners

Reclaimed materials are reused.

Recertify
Entire hard drives are reused as recertified hardware.

Hard drives have a second life cycle.

Ready to Learn More?

Visit us at www.seagate.com/circularity