

OPEN POSSIBILITIES.

Creating the Sustainable Datasphere



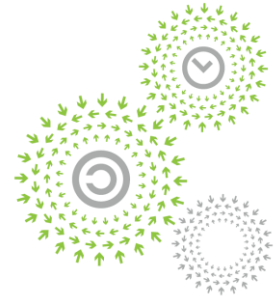
NOVEMBER 9-10, 2021

SI (Strategic
Initiatives)

Creating the Sustainable Datasphere

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OPEN
GOLD®



Global Data Explosion

Impact on Sustainability

- Data growth has a projected CAGR of 25% through 2030
- Most installed data will be on hard drive discs
- Manufacturing, distribution and deployment is important, most CO2 emissions occur pre-use
- Hard drives contain rare earth magnets
- Most hard drives are destroyed and not recycled or repurposed today

If the earth's surface represented 17ZB, a 3MB picture of your cat would fill 1 square foot.

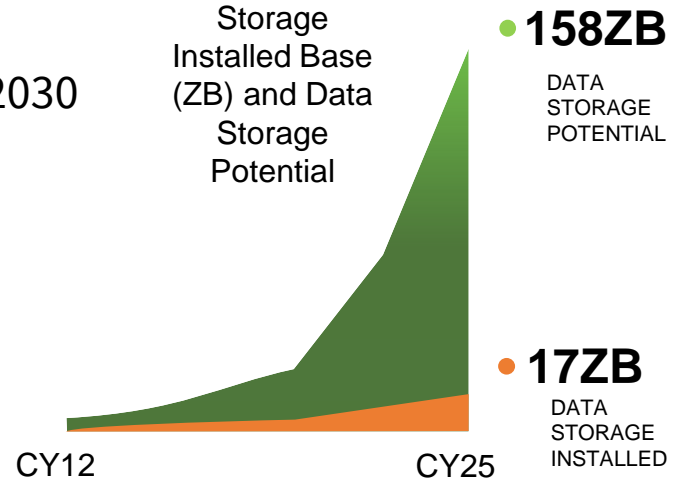
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Source: Data Age 2025, sponsored by Seagate with data from IDC Global Datasphere, Nov 2018 ZB - Zettabyte



HOW DATA HELPS



SUSTAINABILITY



Data generated by Autonomous vehicles (AV) keeps drivers safe and improve overall traffic health.



Smart manufacturing factories utilizing more data can improve model performance up to 70%



Data from smart cities improve security, public utilities and traffic management.



Source:

1. Renovo Auto 2019

2. Projection based on Seagate head slider manufacturing yields scaled to potential for smart factories as a whole. Related article: https://www.researchgate.net/profile/David_Martens4/publication/274480415_Predictive_Modeling_With_Big_Data_Is_Bigger_Really_Better/links/5e5f7dab4585152ce8053c7c/Predictive-Modeling-With-Big-Data-Is-Bigger-Really-Better.pdf

3. Smart City White Paper <https://branding.seagate.com/documentpreview/b18ed892-5a52-47b3-bcb7-15c3f4af71ad>

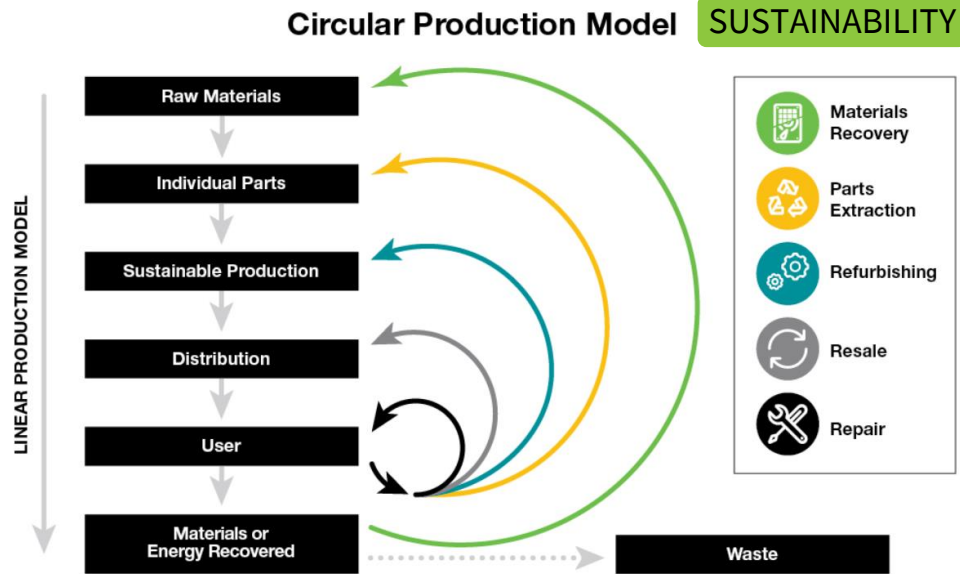
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Phases of the Sustainable Datasphere



1. Design: Increased drive capacity, ease of recycling, power efficiency, security...
2. Manufacturing: Use of scarce materials, recycled content, packaging
3. Life of drive: Power consumption, **Repair in field to extend the usable life of your hardware**
4. Disposal: **Reuse and Recycling**



LCA: <https://www.seagate.com/global-citizenship/life-cycle-assessment>

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CORVAULT Implementation of Autonomous Drive Regeneration (ADR)



SUSTAINABILITY

*For SUSTAINABILITY The HIGHEST value is REPAIR in the field,
to EXTEND THE USABLE LIFE of your hardware*



Maximize Sustainability

CORVAULT self-healing capability (ADR)
enable drives to continue functioning in-
system when other systems require HDD
return and replacement



1. Drive alerts controller of issues

**4. Volume is rebalanced
with renewed drive**



**2. Controller offloads data to
other drives and removes
drive from logical volume**

**3. Drive & controller diagnose
incidents and regenerate drive**

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Barriers to Reuse and Recycling



SUSTAINABILITY

- Perceived data security risks
- Government regulations around proof of data destruction
- Technological challenges in HDD separation
- Lack of supply chain coordination
- Users demand physical destruction even when complete, verifiable data wiping is possible

This leads to widespread HDD shredding, which precludes reuse, harvesting of components for, and recovery of critical and strategic materials including rare earth magnets



***Creating a sustainable
Datasphere requires effort and a
new mindset***

***10's of millions of drives are destroyed each
year.***

The paranoid choose degaussing, followed by shredding, followed by disintegration.

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Retain, Reuse, and Recover

- **Retain:** CORVAULT/Automatic Drive Regeneration (ADR) to keep drives in service
- **Reuse:** There is a robust secondary market for HDDs through instant secure erase
- **Recover:** Disassemble HDDs in data centers to recover rare earth magnets before shredding
- **Recover:** Technology for high throughput and high scale magnet recovery after shredding

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BUILDING RESILIENT
SUPPLY CHAINS,
REVITALIZING AMERICAN
MANUFACTURING, AND
FOSTERING BROAD-BASED
GROWTH

100-Day Reviews under
Executive Order 14017

June 2021

A Report by
The White House

Including Reviews by
Department of Commerce
Department of Energy
Department of Defense
Department of Health and Human Services



SUSTAINABILITY



In a [June 2021 report on strengthening supply chain resilience](#), Biden administration officials wrote that the 4,000 U.S. government-operated data centers represent a “near term opportunity” to harvest rare earth magnets using federally funded research and development.



Certified Erase Enables the Circular Economy

Self Encrypting Drives and Essential Data Protection



Provides confidentiality for data stored on media

- › High-speed AES256-XTS data encryption
- › High quality keys managed by drive
- › High-level of assurance
 - Crypto: NIST FIPS 140-3
 - Product: Common Criteria
 - Supply Chain: ISO 20243



Provides secure disposal of data/device

- › Data Purge via Cryptographic Erase of data stored on media
 - NIST SP800-88rev1
 - ISO/IEC-27040:2015

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Call to Action

- Repurpose drives using Certified Erase:
<https://www.seagate.com/articles/enterprise/seagate-secure-certified-erase-protects-data/>
- Deploy CORVAULT self-healing high density data storage:
<https://www.seagate.com/products/storage/data-storage-systems/corvault/>
- Keep abreast of new recycling and reuse technologies and government initiatives
- Participate in and coordinate with the OCP Sustainability working group

Seagate Life Cycle Assessments: <https://www.seagate.com/global-citizenship/life-cycle-assessment/>

Project Wiki: https://www.opencompute.org/wiki/OCP_Sustainability_Initiative

Sustainability Mailing list: <https://ocp-all.groups.io/g/Sustainability-Lifecycles>

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Thank you!



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