Creating the Sustainable Datasphere

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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.*

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

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

Up to 1PB Per autonomous vehicle per year

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

1PB Per day per factory

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

2PB Generated from a limited smart city concept

Source:
1. Renovo Auto 2019

SUSTAINABILITY
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
CORVAULT Implementation of Autonomous Drive Regeneration (ADR)

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

1. Drive alerts controller of issues
2. Controller offloads data to other drives and removes drive from logical volume
3. Drive & controller diagnose incidents and regenerate drive
4. Volume is rebalanced with renewed drive

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

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SUSTAINABILITY

OPEN POSSIBILITIES.
Barriers to Reuse and Recycling

- 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

Creating a sustainableDatasphere requires effort and a new mindset

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

10’s of millions of drives are destroyed each year.

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

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
Call to Action

• Deploy CORVAULT self-healing high density data storage: [https://www.seagate.com/products/storage/data-storage-systems/corvault/](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


Project Wiki: [https://www.opencompute.org/wiki/OCP_Sustainability_Initiative](https://www.opencompute.org/wiki/OCP_Sustainability_Initiative)

Sustainability Mailing list: [https://ocp-all.groups.io/g/Sustainability-Lifecycles](https://ocp-all.groups.io/g/Sustainability-Lifecycles)
Thank you!