The Circular Storage Opportunity

August 9, 2023

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Micron®

Founded nearly 45 years ago on **October 5, 1978**

Headquartered in **Boise, Idaho, USA**

$30.8B
FY2022 revenue

5th
largest semiconductor company in the world

136
on the 2023 Fortune 500

53,000+
patents granted and growing

17
countries

11
manufacturing sites and 15 customer labs

~44,000
team members

Worldwide sustainability ambitions and recognition

Micron environmental targets

Green House Gas (GHG) Emissions

42%

absolute reduction in GHG emissions from operations by CY30 from CY20 baseline

Net zero

GHG emissions from operations and energy use by CY50

Waste

95%

reuse, recycling and recovery, and zero hazardous waste to landfill in CY30

0

hazardous waste to landfill by CY30

Water

75%

water conservation in CY30

Energy

100%

renewable energy in the United States by the end of CY25, Malaysia in CY22

Awards, recognitions, and certifications

Responsible Business Alliance
Advancing Sustainability Globally

Global Lighthouse Network

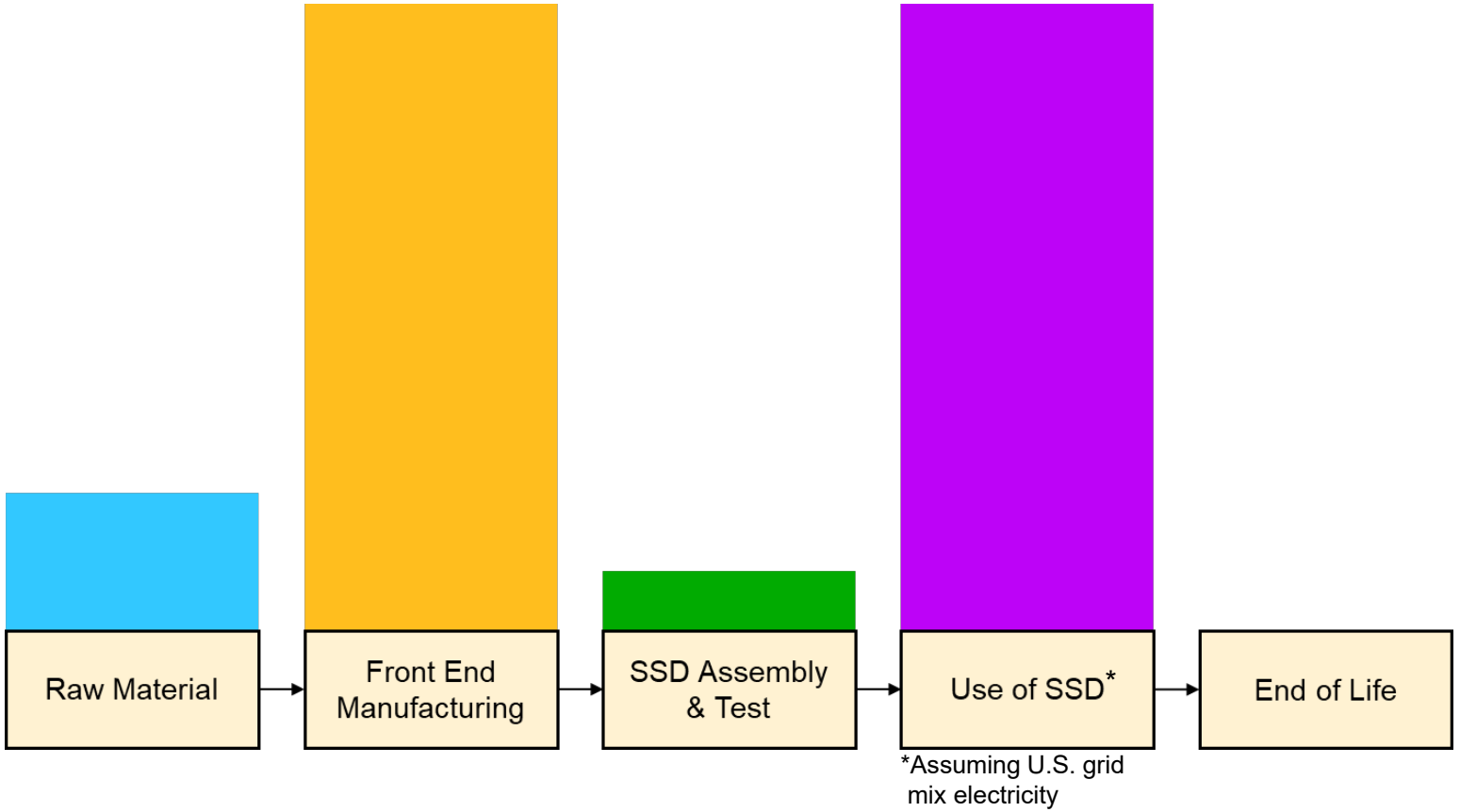
SSDs and GHGs

Technology Companies have big climate goals.

Circular drives can help.

GHG emissions from SSDs: Single Use
Per TB-yr (5yr use)

Greenhouse gas emissions associated with SSDs are dominated by wafer fabrication and use.

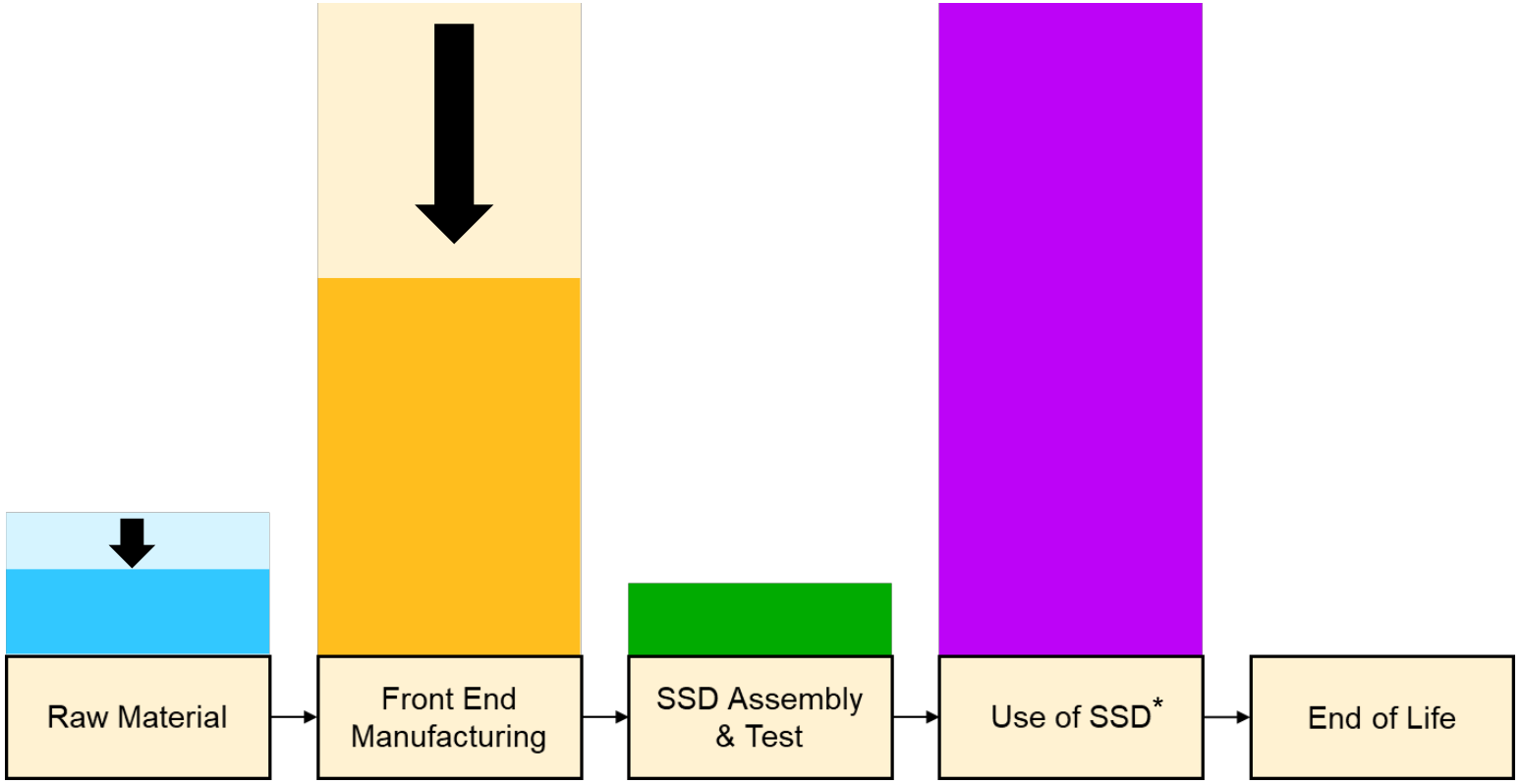


GHG emissions from SSDs: circular use

Per TB-yr, circular life (remanufactured, 8.5yr total use)

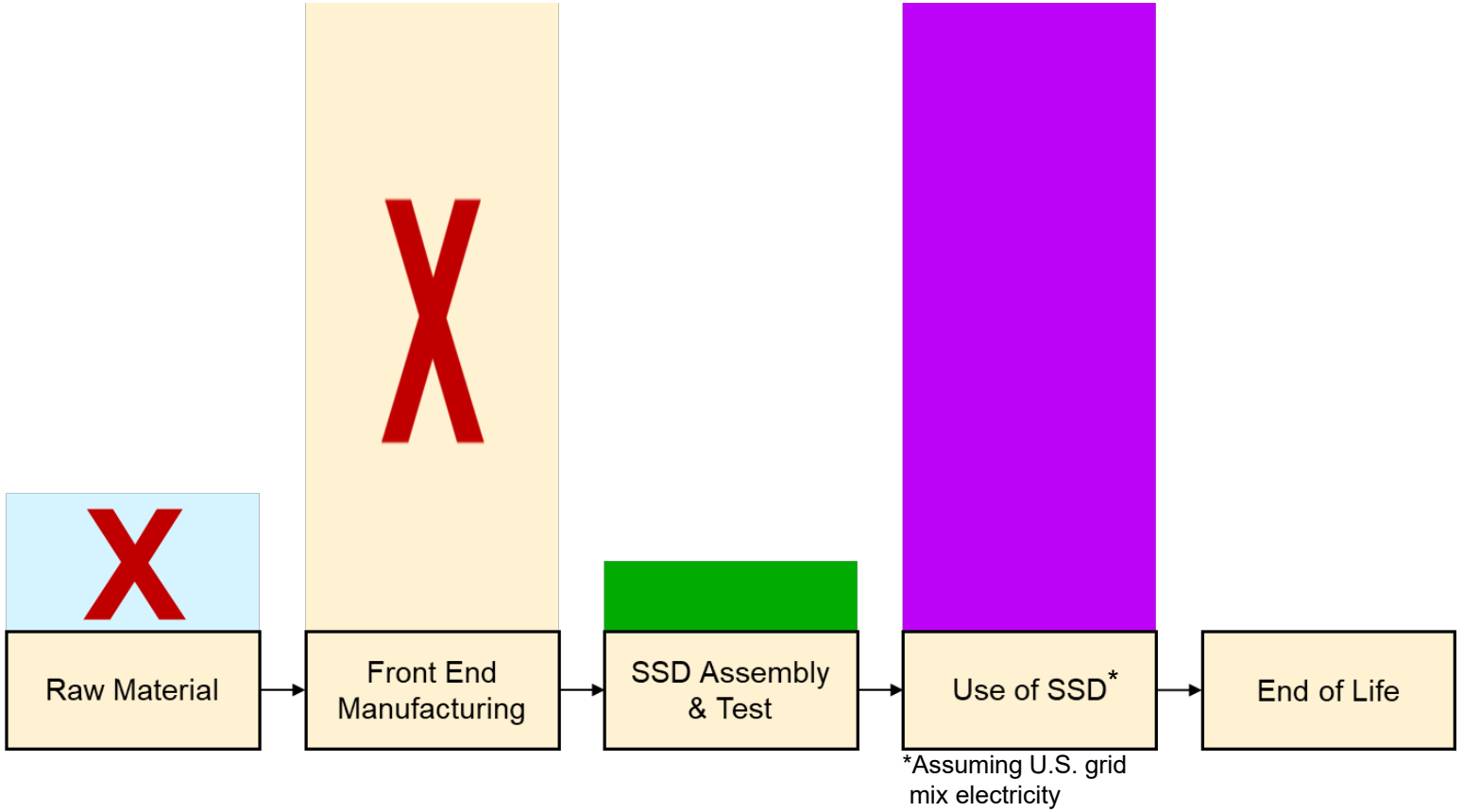
SSDs can often be used (refurbished or remanufactured if needed) significantly longer than their original deployment, without requiring additional intensive raw material and manufacturing steps.

Extending life by 70% may reduce supply chain GHG impact per TB-yr by ~40%.



GHG emissions from remanufactured SSD
Per TB-yr (3.5yr use post-remanufacture)

A remanufactured drive's supply chain emissions may be 80% less than a new drive.



Destruction Drivers

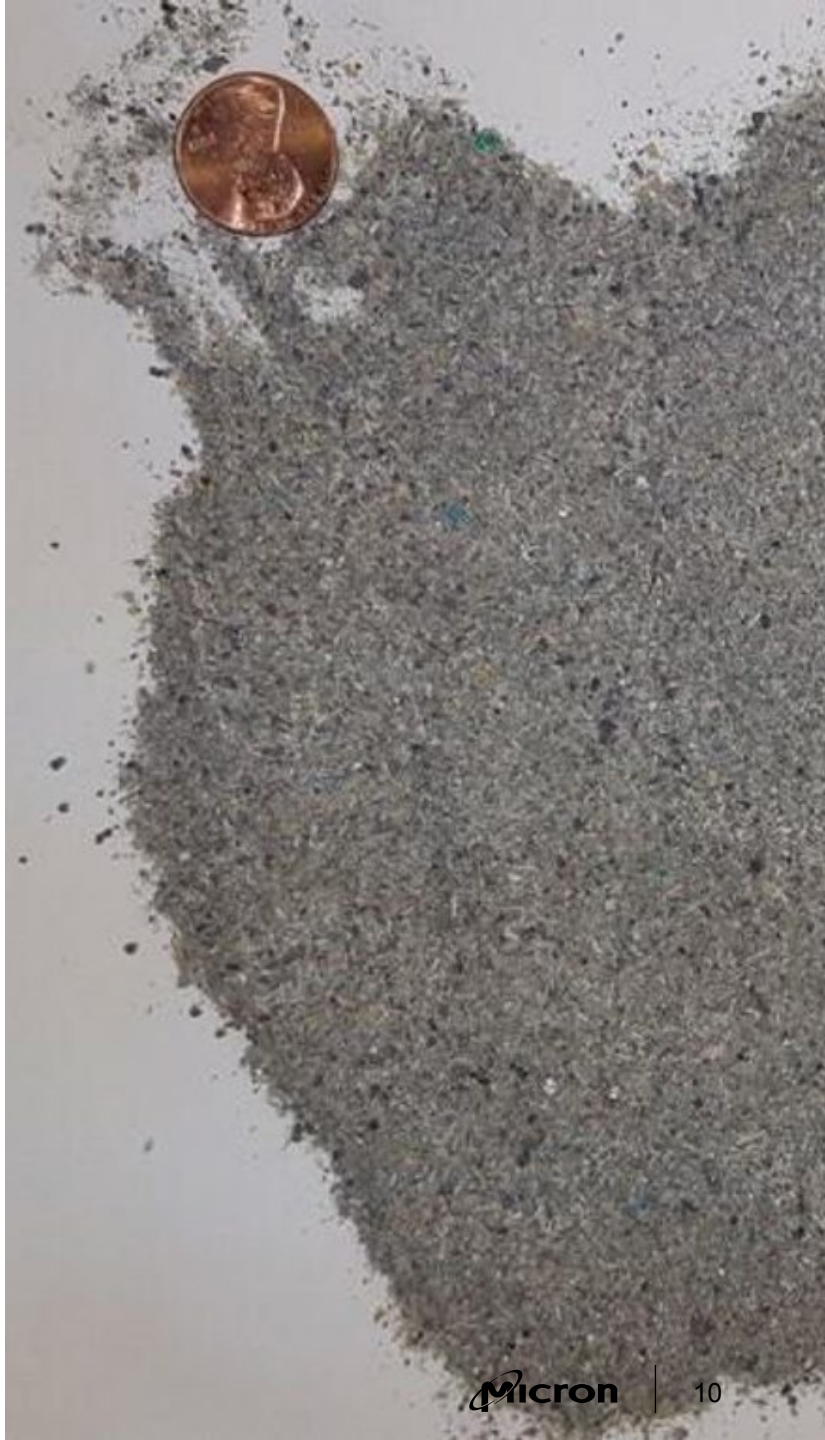
Drives are often removed from service and destroyed prematurely

- **Removal from service:** Standard upgrade cycles decommission equipment after 3-5 years
  - Drives may still be useful for original purpose (for example, if logic upgrades drive replacement)

  OR

  - Drives may be obsolete for original purpose, but still usable

- **Destruction:** Drives are commonly destroyed because companies…
  - Are concerned about potential data loss
  - Follow existing – but potentially outdated – policies and standards
  - Follow customer requirements
  - Are concerned about reputation risk / market norms

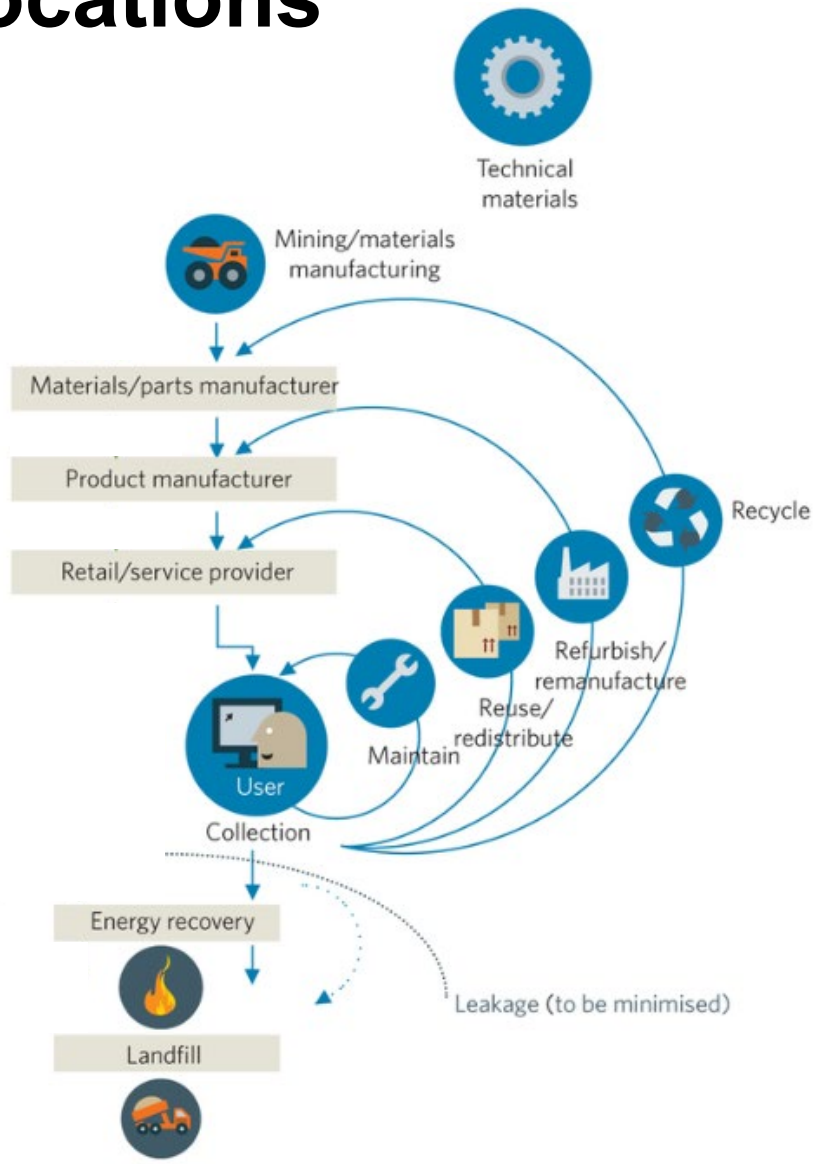


Updated standards & practices can **reduce impact** and help companies **achieve their sustainability goals**

Issues for Consideration

Financials, circularity options, and allocations

- Consider financial value of used drives – significantly greater than value of raw materials or cost of disposal
- Consider stages of circularity:
  - Maintaining drive in place longer
  - Reuse by another party
  - Refurbish/remanufacture
  - These are all options that can offer higher environmental and financial value than recycling of materials
- Need to consider environmental impact allocation methods (see slides 7, 8, and 14)



Circular diagram adapted from Ellen MacArthur Foundation

GHG Emissions from SSD

Per TB-yr, circular life (remanufactured, 8.5yr total use, value-based emissions allocation)

Emissions can be allocated between first use and refurbished drive based on product value instead of a product / byproduct basis (slide 8) or total lifespan basis (slide 7).