

# CLOSING THE LOOP

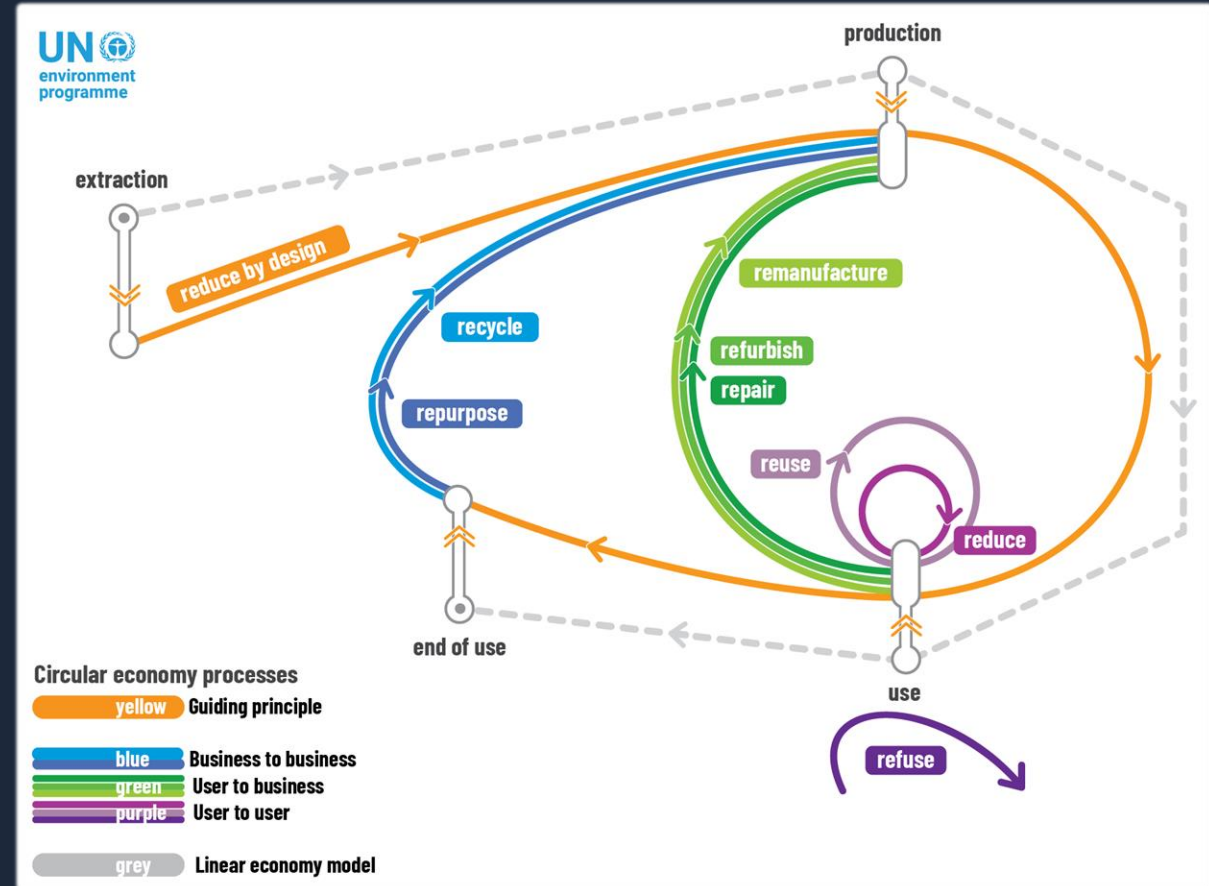
ENHANCING CIRCULAR MANUFACTURING WITH  
GENERATIVE AI

The world economy is now:

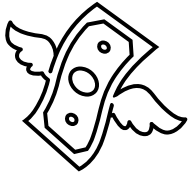
- ~~9.1 %\* Circular~~
- ~~8.6 %\* Circular~~
- ~~7.2 %\* Circular~~



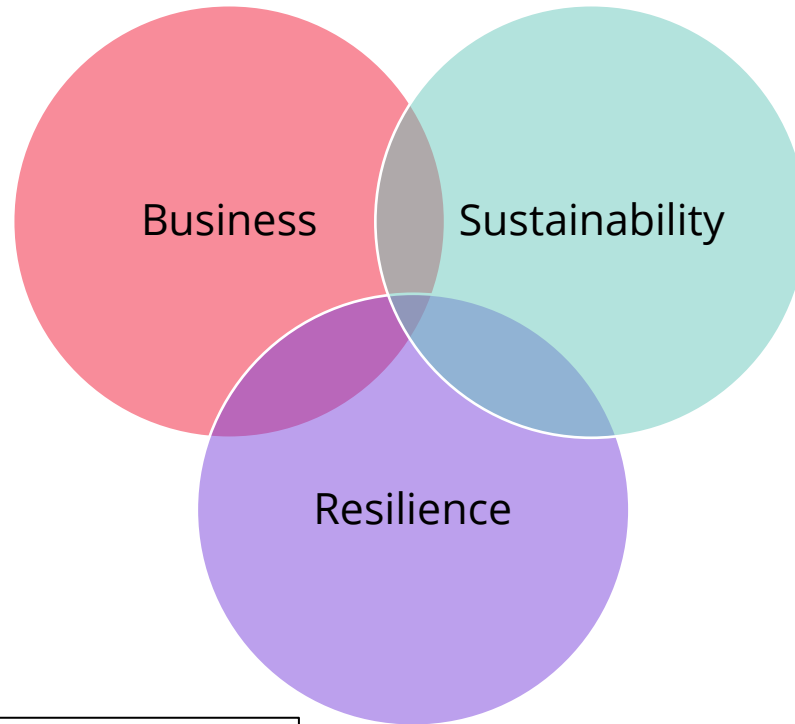
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# BENEFITS OF REMANUFACTURING



- Cost savings of 20-80%\*
- Increased material prices\*\*
- Consumer awareness\*\*



- **Raw material use**  
-19% to -95%
- **Reduced energy consumption**  
-14% to -99%
- **CO2e emissions**  
-23% to -90%
- **Waste disposal**  
-35% to -47%



UNIVERSAL ROBOTS Support

Support > Articles > Product Alert: e-Series robot joints

## PRODUCT ALERT JOINTS MICROCC

Product Alert: e-Series robot joints mi

Last modified on May 06, 2022

**ABB** > Offerings > Robotics > Service > Remanufacturing and Workshop Repair

### Extending equipment lifetime

Over the last 30 years, we've given thousands of our robots a second life through our global program of remanufacturing and upgrades. We have remanufactured over 12,000 robots globally.

\*\*

\*Ijomah 2002 2002. A Model-Based Definition of the Generic Remanufacturing Business Process, doctoral thesis, University of Plymouth.

\*\* Contribution of remanufacturing to circular economy – Eionet 2021



# WHAT IS THE CHALLENGE?

- Meeting regulations (RoHS)
- Feasibility
- Regulatory establishment and (Recycling Waste/Remanufacturing)
- Making data and process for products with much higher variation!
- Cost of labor and establishment
  - Bin picking
- Uncertainties
  - Grading/QC for used products.
  - Quality of product and components
  - Irreversible process on products of unknown quality
- Various types, series, versions, quality levels etc.
- Disassembly of products



LinkedIn

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Konsulent hos Teknologisk Institut  
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Component grading

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Visual inspection & quality

8

