

Manufacturing in Scotland

Manufacturing plays a crucial role in Scotland's economy, contributing significantly to its growth and prosperity. Manufacturing provides high quality jobs, many of which are highly skilled positions. The manufacturing industry in Scotland is a hub for innovation, investment, and research, with new products, processes and technologies being developed at pace.

By applying circular economy practices such as remanufacturing, refurbishing, repair and reuse, the benefits to the sector would include increased resilience against supply chain disruptions, reduced energy consumption, reduced waste generation and lower material input by keeping materials in circulation for longer.

Zero Waste Scotland estimates that Scottish manufacturers could benefit from potential growth of remanufacturing from its current value of £1.1 billion to nearly £1.7 billion with the addition of 5700 new jobs.

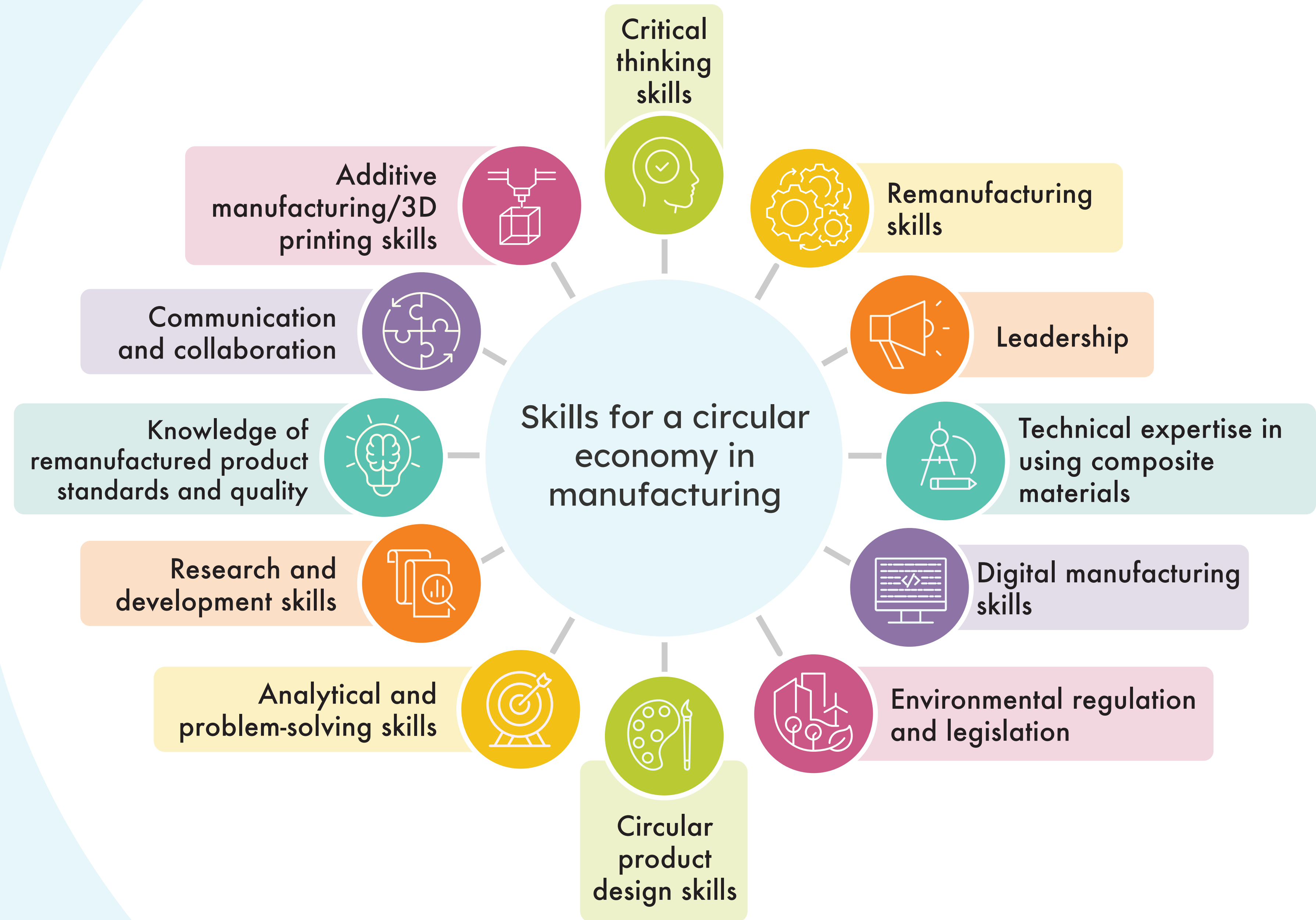
Remanufacturing is a procedure in which all components of a product are completely disassembled down to their smallest parts, are fully inspected and then reused for an entire new life cycle.

Reference: Circularity Gap Report Scotland 2023.



Since the 19th century, Scotland has been hailed as one of Europe's industrial powerhouses, with a strong and proud history in leading heavy manufacturing.

This has created a legacy of manufacturing knowledge and expertise which can be harnessed and embraced as the sector transitions to adopting more widespread circular practices, essential to this will be incremental skills development as outlined.



Manufacturing Sector **Circular Jobs**

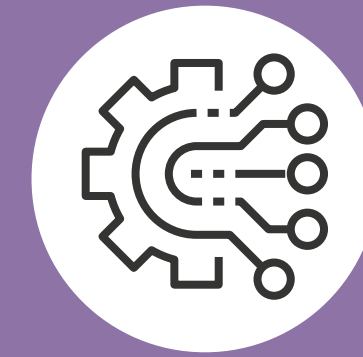
What do circular jobs look like in the manufacturing sector?



Disassembly operatives: Process of breaking down the structure for reuse and recycle in accordance with product requirements.



Test Engineers: to determine whether remanufactured products meet original quality specifications.



Sorter: responsible for identifying and categorizing items for the purpose of remanufacture

These roles will use **waste as a resource**, **sustaining and preserving** what is already there and **assess assets for reuse and remanufacture**.

Manufacturing Sector

Enabling Circular Jobs

What kind of jobs will enable the circular economy in manufacturing?



Procurement officers will need to keep an overview of products and materials in the value chain and build relationships with suppliers.



Logistics managers to manage complex reverse logistics systems to transport products to and from remanufacture.



Product designers will need to embrace designing for disassembly and make remanufacture and restoration a primary consideration in the design of new products.

These roles will ensure more jobs become circular through **incorporating digital technology**, **designing for the future** and **providing services** to core circular strategies which will increase the effectiveness of circular jobs.

Case Study

Ocean Plastic Pots

Ocean Plastic Pots use 100% waste rope and fishing net to manufacture their plant pots.

Skills: Research and innovation, circular design and product development.

Roles: Recycler, Graphic Designer, Marketing Manager, Brand Consultant.

Examples: **Product Designer:** Creating prototypes applying technical and digital skills. Knowledge of the materials for manufacturing to ensure extended product lifetime.

Recycler: Project manages the waste stream to go through the recycling process. Expertise in specific material, resource recovery, waste transfer and contamination of waste materials, responsible for quality assurance of materials in the recycling process.

Collections and sorting: Technical expertise in different polymer types and recovered material for reuse and recycling. Data and analytical skills for managing large quantities of recovered materials.



Case Study

Freeflow Technologies

FreeFlow Technologies (FFT) has developed a light compact E-Bike transmission, allowing riders to have an E-Bike that looks and rides like a normal bike with all the benefit of rider assistance. Rather than throwing away an expensive E-Bike at end of life the system creates the opportunity for circularity through repair and servitization for the global bike sector.



Skills: Collaboration, quality assurance, research and development, pioneering, innovative, technical and engineering skills.

Roles: Electronic Engineer, Quality Control, Mechanical Design, Technical Support, Software Engineer, Commercial.

Examples: **Design Manager:** With an engineer and manufacturing background in bicycle, motorcycle and battery sectors, expertise in research and development, quality control and product design specification knowledge.

Mobile Mechanic: Expertise in modular mechanics, Cytech accreditation. Effective communication and organisational skills. Customer service skills to promote a servitization model.

Keela Outdoor Clothing



Keela Outdoor Clothing are experts in delivering high-quality, innovative outdoor clothing. For over 40 years, Keela's 'hospital' has saved garments from destruction. Repairing items through stitching, patching, sealing, and bonding to keep valuable garments in use. Committed to Scottish manufacturing and sustainability, Keela have developed 'The Legacy Project' to identify further opportunities to extend garment life and avoid landfill of clothing. A number of specialist roles support these initiatives.

Skills: Innovation, Pioneering, Research & Development & Quality assurance

Roles: Sales, Supervisors, Production Manager, Design and Garment Technologist, Machinists

Examples: **Machinists:** Knowledge and understanding of various techniques to stitch fabrics and add embroidery, buttons, and zips to produce finished garments. Enhanced skills are needed to deconstruct or cut an existing garment for repair. Machinists supported the manufacture of 750,000 hospital gowns during the pandemic. Focus is now on making first responder uniforms, changing robes for wild swimming, and wax jackets for hillwalking.

Design and Garment Technologist: With a production background in textile sectors, expertise in research and development, quality control, testing and product design specification knowledge.