



SMART HUMAN-CENTRIC REMANUFACTURING

# Europe's Remanufacturing Industry: How Does It Compare Globally?

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**As sustainability takes center stage, remanufacturing has emerged as a pivotal player in reducing the environmental impact and driving economic growth. This article compares the European Union's (EU) remanufacturing sector with those of the USA, Japan, and China, using the EU as a benchmark.**

According to European Remanufacturing Network, the EU's remanufacturing industry generates a turnover of €29.8 billion and employs around 190,000 people. The sector includes key industries such as aerospace, automotive, and heavy-duty off-road (HDOR). Nations like the UK, Ireland, France, and Italy dominate, with Germany excelling due to its robust aerospace and automotive sectors. However, challenges such as low consumer recognition and limited access to quality core materials persist.

### **Remanufacturing within the EU still limited**

Despite its efforts, the EU's remanufacturing sector represents only 1.9% of the total production value. According to data available, it saves 2.3 million tonnes of landfill material and reduces CO2 emissions by 8.3 million tonnes annually, these achievements highlight the potential for significant growth rather than current dominance.

Alessandro Di Maggio of Lumibird, one of rEUman project partners sees a strategic opportunity for the **optoelectronic industry** in EU: "In the optoelectronics market, Europe is expected to reach a revenue of €4.01 billion by the end of 2025, with a CAGR of 1.96% from 2025 to 2029 based on the Statista report. This growth reflects a rising demand for advanced, energy-efficient technologies. Remanufacturing can help meet this demand while reducing waste and preserving critical raw materials, which are mainly imported from non-European country. Beyond technological challenges, remanufacturing represents a strategic opportunity for Europe's optoelectronics industry, promoting economic growth, job creation, and environmental sustainability. Collaborative efforts between policymakers, industry stakeholders, and research institutions will be pivotal in realizing this potential," concludes Di Maggio.

### **Looking at the competitors – United States of America**

The USA's remanufacturing sector is valued at approximately €45.6 billion, employing around 180,000 people according to StartUs Insights report on United States Remanufacturing Market. The US leads in technological adoption, including AI-driven inspections and additive manufacturing, which enhances efficiency and product quality. Government support through tax incentives and grants further bolsters the sector. However, the US places less emphasis on environmental goals, focusing more on energy savings.

Comparing Home appliances sector, Hakan Amaç from BEKO, a rEUman partner observes:

"Remanufacturing of washing machines is not very common, but there are some companies in the USA that remanufacture old washing machines of different producers. They replace the necessary parts, check the main functions and clean them before selling them again with some service support warranty."

This way to remanufacture the washing machines is still not very common in the EU. There are a few factories, and they sell those limited number of remanufactured products only to their employees," continues Amaç. "If remanufactured professionally by producers, the remanufactured washing machine looks almost as new as a brand new one, plus with some producer's warranty. Because cores have been checked, even the smallest defects have been repaired or replaced and all main functions and safety tests are applied, remanufactured products are ready to use for a long time. It is a great added value for the environment and the regeneration of natural resources."

### **What about Asian competitors?**

Based on the information from Statista and researches that are dealing with the diffusion of remanufacturing policies in Asia and analysis of remanufacturing practices in Japan published in Journal of Automation technology and Journal of remanufacturing respectively.

Japan's remanufacturing industry is valued at around €11.5 billion and employs about 100,000 workers. The Japanese government actively promotes remanufacturing through initiatives like the Law for the Promotion of Effective Utilization of Resources. Japan excels in resource efficiency, reducing consumption by up to 80%. Nonetheless, the sector struggles with consumer education and acceptance, similar to the EU.





A study conducted by Yuan and colleagues in 2020 reviewed how China can transition to a circular economy through remanufacturing. They discovered that China's remanufacturing sector is valued at approximately €26 billion and employs 300,000 workers, growing at an impressive 10% annually. Supported by extensive national policies, China focuses on resource conservation and achieving significant energy savings. However, the sector faces challenges such as unclear institutional responsibilities and gaps in the legal and standards system, which hinder its growth.

Lorenzo Gaspari from BORG, a rEUman partner comments on these latest trends:

"From an automotive perspective, the US market has been observed for many decades as a very mature one with several established independent and OES (Original Equipment Supplier) remanufacturers. Europe follows on this path of maturity. On the other hand, the impression is that China is developing rapidly in the last years, with an increased focus on remanufacturing as before. While we don't see companies serving one continent from another one, due to the reverse logistic cost, it is increasingly common that some have been establishing their production presence across continents through M&A (Mergers and Acquisitions) and JV (Joint Ventures)"

Overall, the EU is firmly positioned with its robust regulatory framework, environmental impact, and focus on innovation. However, it lags behind the USA in market size and technological adoption, and behind Japan in resource efficiency. By addressing challenges related to consumer acceptance and learning from global leaders, the EU can enhance its position in the global remanufacturing market.

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*rEUman is a cutting-edge European research project funded by the European Union, and led by Il Politecnico di Milano. The Initiative is dedicated to digitally-enhanced multi-level solutions for smart human-centric remanufacturing. The ambition of rEUman is to fundamentally reshape remanufacturing through innovative technologies and sustainable practices at factory levels integrating them into the value chain of respective target industries. Please, find more information here: [www.reuman.eu](http://www.reuman.eu).*

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