

Science for Environment Policy

Circular economy could boost employment and cut raw material extraction by 2030

A more circular economy could reduce global levels of raw material extraction by 10% by 2030, a new study suggests. It could also drive a slight increase in overall employment levels, but the types of jobs available would change significantly, moving away from low- and medium-skilled work in the manufacturing and mining sectors and opening up more opportunities for medium- and high-skilled jobs in the service sector.

Momentum is gathering in society's move towards a [circular economy](#), which promotes the design of long-lasting, resource-efficient goods that can be repaired, reused and recycled. Recyclable and recycled materials are increasingly integrated into new products, for instance, in the automobile industry, and more companies are offering product rental or sharing services (printer companies selling printing services instead of printers themselves, for example).

A circular economy brings major changes in production and consumption that may have far-reaching effects on both the economy and the environment. While there are still many behavioural and policy barriers to overcome before a circular economy can be fully realised, new research explores whether averting environmental catastrophe via this type of economic system could also deliver sustained growth and jobs.

The researchers predicted the potential material extraction and employment impacts of 200 product groups (representing 163 industries) for the year 2030. They used a modelling method called multiregional input-output (MRIO) analysis to track environmental and economic impacts along each step of a product's supply chain using data from [EXIOBASE](#). This database provides production and consumption data for product groups across 44 countries and five global regions. It includes indicators for material requirements and employment per gender and skill level (covering six types of labour: male and female in high-, medium-, and low-skilled work).

They made three key assumptions about this future circular economy:

- **The market share of secondary (recycled material) industries in every country will rise to 65% by 2030**, with a corresponding reduction in primary (raw material) industries to 35%. This statistic mirrors the current situation, where industries for raw materials, such as metal ores, have an average share of about 65%.
- **Goods will be designed and manufactured to be more durable**, in order to reduce the overall amount of materials consumed through product replacement. As such, there will be an annual 1% increase in material efficiency across all product groups.
- **There will be more repairing, re-using and sharing of goods.** This will require a larger service sector, and lead to a 1% drop in demand for machinery goods each year.

The researchers describe this scenario as a 'stylised extreme', but suggest it helps provide a first insight into some of the possible implications of a circular economy.

The results of their analysis suggest that about 10% less raw material would be extracted in 2030 worldwide¹, compared to levels under a business-as-usual scenario for the same year. The figures vary by material — for example, a 27% drop in metal extraction is predicted, an 8% cut in forestry products and a drop of about 7% in non-metallic minerals.

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1. Separate research highlights future overall increases in raw material extraction, compared with current levels, and despite shifts from manufacturing to service industries and continual improvements in manufacturing efficiency. Given that the world's population is still rising and will keep rising for several decades, and that the percentage of the middle class is also growing, more will be consumed and extracted. See, for instance, OECD (2018) [Global Material Resources Outlook to 2060: Economic drivers and environmental consequences](#).

Also see the UN's International Resource Panel report: [Assessing global resource use: A systems approach to resource efficiency and pollution reduction](#)

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In most countries, the scenario presented in the study promotes employment and the model shows a small increase in overall employment levels around 3% higher than under business-as-usual circumstances. However, the results reveal big shifts in future employment patterns — shifts away from mining and manufacturing and towards service industries such as repairing and renting.

This employment shift is likely to benefit women in particular, who are more likely to work in medium-to-high-skilled service sector roles. There will be a corresponding drop in low-to-medium-skilled jobs typically occupied by men, especially in Asian economies, where a large number of low-skilled jobs in manufacturing are located. These results suggest that it will be necessary to retrain workers in order to create a skilled workforce able to take on the challenges of a circular economy.

The researchers say that their study helps reveal some of the potential global co-benefits — as well as the costs — of a circular economy. For more precise results, the researchers say that better data are needed, as is a better understanding of economic development in the global south, where significant amounts of materials are extracted.

