

Making remanufacturing profitable

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Returning end-of-life products to an as-new condition is called remanufacturing and can be an essential element in a circular economy. But for more industrial companies to take an interest in it, remanufacturing must be economically viable. In a doctoral thesis from Linköping University, Johan Vogt Duberg has investigated how this can

be accomplished.

"It's possible to take advantage of increased [environmental awareness](#) to gain economic benefits. With remanufacturing, the costs of raw materials can be reduced, new customer groups found and new circular business opportunities realized," says Johan Vogt Duberg, new doctor of technology at Linköping University.

In his doctoral thesis, he investigated how so-called remanufacturing can be attractive for [industrial companies](#) that are original manufacturers of various products.

Remanufacturing means that end-of-life products are transformed to work as new again, both in terms of function and appearance. These products are referred to as cores. The principle can be used for a variety of products, from lawn mowers and trucks to computers and car parts.

Unlike traditional repair, remanufacturing is an [industrial process](#) that must involve a clear working procedure, just as in new production. It also means that the volume of returned cores must be large enough to maintain a kind of assembly line production.

"You might get 100 cores one day and nothing the next. Then you get no scale in the process, no efficiency and thus no profitability. Continuity is needed for it to keep going all the time," says Vogt Duberg.

In order to ensure that the original manufacturers get their end-of-life products back at a predictable rate, Vogt Duberg thinks that several different approaches can be used. These include deposit schemes, buy-back of cores, and leasing, where a provider company can own the product throughout the use phase and it is returned at the end of the contract.

"Then the company never has to buy the core to enable remanufacturing. There are no costs for the core itself and the company receives almost all the materials needed to make a remanufactured product that performs the same as a new one," says Vogt Duberg.

Currently, remanufacturing represents only about 2% of the total manufacturing industry. Vogt Duberg thinks that this may be due to the challenges that exist.

"It's much more complex than new manufacturing. Every core that comes back is unique. This means that a company that remanufactures must have a very flexible process that adapts to each core in order to be effective and thus get the financial rewards and environmental benefits," he says.

Vogt Duberg thinks that many companies need to switch to new business models in order to use remanufacturing in a way that increases profitability. His research focuses on this by describing what companies need to take into account before starting to remanufacture products. In addition to profitability, there is also an increased awareness of the environment and sustainability, as well as potentially stricter directives on efficient resource management from, for example, the EU, to consider.

To facilitate this transition, Vogt Duberg has developed a framework that describes how companies can approach remanufacturing and assess the economic benefits.

"To succeed, you need to really invest in remanufacturing. A company can't just start from one day to the next. It takes time and energy."

More information: Johan Vogt Duberg, Remanufacturing Initiation for Original Equipment Manufacturers, (2024). [DOI:](#)

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