

Summary of Lexmark activities in the C-SERVEES project

Overview

Lexmark participates in a four-year-long EU-funded R&D project, known as the C-SERVEES project. Within the project, Lexmark carried out several activities to examine new business models that could potentially contribute to enhancing the circular economy's electric and electronic sector.



As part of the printer and cartridge demonstration, Lexmark collaborated with other consortium partners and provided several printer and cartridge units to test and validate different business cases which could facilitate the further usage (dismantling, component recovery, recycling) of end-of-life printers.

Dismantling, part recovery activity

After creating a unique instructional manual for printer dismantling, recyclers validated its utility, proving the manual can reduce the necessary costs, time, and human resources while dismantling the device. In addition, the manual outlines the access and identification of hazardous and toxic materials and valuable parts, which could be recovered for reuse. For the faster identification of components, colour coding could be developed and implemented. Recycler partners have also been asked to dismantle printers based on the dismantling manual and to recover a list of valuable parts. This approach allows partners to compare a new business case with the current to determine whether a recycler company can carry out the same activities with same quality requirements, costs, time consumption, human resources as a Lexmark manufacturer.



Reclaimed ABS plastic resin

To examine the feasibility of incorporating the reclaimed material into new cartridge housings, Lexmark tested three sources of recycled ABS plastic material: Lexmark cartridges, Lexmark printers, and printers from other brands collected by a recycler.



After passing all quality control tests and successfully integrating the material into production, the results showed that recycled ABS plastic from Lexmark cartridges could be incorporated for future use.

In the case of Lexmark's end-of-life printers, analyses found metal, polycarbonate, and rubber contaminants in its reclaimed plastic. As for non-Lexmark end-of-life printers, researchers discovered the same contaminants, as well as bromine, in their material. All impurities discovered prevented further usage, which ultimately heightened the focus on improving the separation and removal process to eliminate all contaminants.

Lexmark Equipment Collection Platform (LECP)

A new web-based hardware collection tool has been developed with the involvement of a third-party service provider. The tool is an extended version of

the Lexmark Cartridge Collection Program (LCCP) platform that Lexmark already applies for cartridge collection. The aim is to increase the EMEA refurbish volume by leveraging, enhancing, and automating all internal processes and optimizing costs as much as possible.

3D printing

Lexmark investigated the potential benefits of using 3D technology to print parts when refurbishing printers and changing damaged parts instead of using new parts or refurbished parts. The outcome revealed 3D printed internal plastic parts had a rough and wavy surface, which is not acceptable for such sensitive components, and it is not a breakthrough option to cut costs. However, at Syncreon, packaging parts have been 3D printed and successfully implemented for general use.

Customer survey, refurbished printer test

To better understand distributor and partner needs and to further improve Lexmark's refurbishment programs, Lexmark conducted several interviews with them to collect their insights and expectations towards refurbished products. A few partners tested refurbished printers with cosmetic defects to provide feedback based on user experiences. The conclusion found cosmetic defects were not visible to the users, and they did not specifically care about minor scratches, but instead prioritized how well the printer works and how they could purchase the refurbished product at a lower cost than a new printer with the same warranty and service.

Promotion of Circular Economy Business Models on refurbished printers

A few short videos have been created in different languages to promote refurbished products and their acceptance on EU and national level. Lexmark launched a C-SERVEES social media campaign on refurbishment by posting videos, blogs, and infographics on [LinkedIn](#) and on Lexmark's EMEA Twitter channels.

ICT tools

Lexmark was collaborating with Information and Communication Technologies (ICT) platform developer companies. Lexmark has been testing the different functionalities of ICT platforms like tracking and certifying recycled material content, creating QR codes and weblinks, and testing reverse logistic functions and information exchange tools. These platforms are based on blockchain technology which keeps the data safe in a decentralised manner and contributes to enhancing the circular economy.