

CASE STUDY

Circular Economy Medical Textiles

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Problem Statement

Revolution-ZERO have a mission statement to displace single-use medical textiles with more effective, economic and sustainable alternatives. Their model is based on circular economy principles with a focus on preservation and enhanced efficient cycling of all resources with prevention of material waste as a primary target. The Revolution-ZERO circular system has three main circular components being: reuse primarily; followed by repurposing; followed by recycling and remanufacture.

They have been engaging with NHS Stakeholders since 2020 starting with the national reusable masks trials led by Alexis Percival, Environmental and Sustainability Manager for the Yorkshire Ambulance Services Trust. After gaining the CE mark in 2021 Revolution-ZERO have supplied more than 100,000 masks to NHS Trusts and other organisations across England. Based on the University College of London (Biomedical Engineering Team) ISO14040 Life Cycle Analysis each reusable mask has the potential to save 360 grams of carbon and 126 grams of waste compared to disposable counterparts (assuming some loss and damage during normal use).

Case Setting

The Royal Cornwall NHS Hospitals Trust (RCHT) increasingly became a collaborative solution deployment partner for Revolution-ZERO's circular system boosted by the drive of RCHT's sustainability team led by Roz Davies.

Intervention

Through 2021 and 2022 several circular Revolution-ZERO solutions were procured by the Trust including:

- Reusable masks for clinical use that were processed centrally in the hospital laundry;
- Community masks for staff during non-clinical activities including office work and commuting; and

- RFID-tracked reusable aprons for endoscopy

2022 also marked the start of Revolution-ZERO's development contracts through the SBRI Healthcare programme, an Accelerated Access Collaborative programme funded by NHS England, together with Greener NHS.

With funding support from the programme and independent investment, Revolution-ZERO have been working with RCHT to help them move away from single-use surgical gowns and operating theatre drapes by replacing them with high performing, reusable and lower environmental impact alternatives. This work has had to embrace a total circular system approach and has focused on St Michael's, a specialist orthopaedic and breast surgery hospital with four operating theatres.

To enable this work Revolution-ZERO team have installed an 80 square metre high tech barrier cleanroom laundry and surgical textiles packing room near the sterile services department at the main RCHT hospital site. This has allowed them to integrate their processing workflows into sterile services enabling delivery and pick-up with reusable surgical tools for a seamless experience to, from and into operating theatres. They have also been developing and validating low temperature decontamination processes to reduce the emissions from heating water.

Measurement

Combined these circular economy solutions have the potential to save more than 25,000 tonnes of waste and 350,000 tonnes of CO₂e emissions across the UK. Through adding more control over the supply of critical products required for surgery and by employing local people there are multiple advantages. Early modelling suggests there will also be significant cost savings for Trusts if fully integrated solutions are rolled out.

Though in the early stages they are now actively scaling up in Cornwall and working towards deploying in other regions both in the UK and Europe.