

86.3% Carbon Emissions Reduction with a Reusable Sharps Container

The UK National Health Service (NHS) aims for Net Zero carbon by 2040 and requires suppliers to do the same. Product Carbon Footprints (PCF) measure greenhouse gas emissions throughout a product's lifecycle. Sharps containers have four lifecycle stages – suppliers can reduce their product's PCF by altering unit processes in these stages.



Objectives

To compare the Global Warming Potential (GWP) of Sharpsmart reusable sharps containers manufactured with 100% new Acrylonitrile Butadiene Styrene (nABS) (Sharpsmart UK, SRSC), with single-use sharps containers manufactured with 80% recycled polypropylene (rPP).

Design

We used BS PAS 2050:2011 principles, a thrice-published quantitative model, and a purpose-designed, attributional "cradle-to-grave" life cycle tool, to determine the annual GHG emissions of the two sharps containment systems. Scope 1, 2, and 3 emissions were included. A sensitivity analysis examined optimizations of unit processes in both systems.

The setting for this theoretical conversion of NHS Trusts from Sharpsmart reusables to single-use containers containing 80% recycled polymer was conducted across 62 acute-care hospital Trusts in the UK based on a one-year period.

Results

To service the 62 NHS Trusts for one year in comparison to single-use sharps containers manufactured with 80% recycled polymer, Sharpsmart reusable sharps containers achieved:

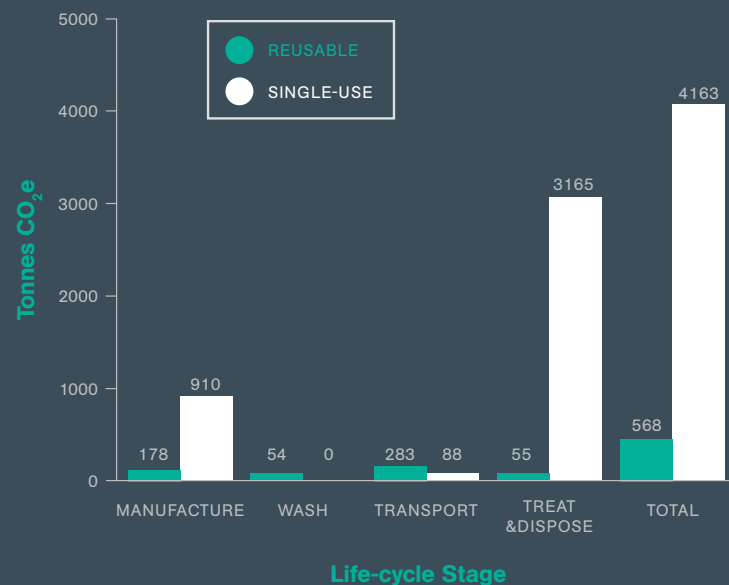
- GWP reduction of 3,595 tons of CO₂e (-86.3%)
- Elimination of production/disposal/recycling of 127.4 tons of cardboard
- A 45.7% reduction in labor required for sharps container exchanges
- A diversion of 1,004.5 tons of plastic from high-temperature incineration.

Conclusions

The study found that converting to the Sharpsmart reusable sharps containment system offers NHS Trusts an opportunity to markedly reduce the GWP of their sharps waste stream permanently and immediately, without behavioral change by users.

RESULTS

CARBON FOOTPRINT REUSABLE VS SINGLE-USE



GLOBAL WARMING POTENTIAL:

Comparison of life-cycle stages of reusables vs. single-use manufactured with 80% polymer.