50 Tonnes of Plastic Reduced Annually with a Reusable Sharps Container

Carbon footprint can be significantly impacted by transport distances between polymer manufacturer, container manufacturer, user and processing facilities. However more significant is the manufacturing, treatment and landfill burden of single-use plastic containers.

Objectives

To examine the impact of Greenhouse Gas (GHG) Emissions on nation-wide transport distances when a large US health system converted from disposable to reusable sharps containers.

Design and Methods

We used a "cradle to grave" life cycle GHG tool to examine the GHG emissions during 12 months of facility-wide use of Disposable Sharps containers (DSC) and Daniels Reusable Sharps containers (RSC) at Loma Linda University Health, an 1100 bed US, 5-Hospital system.

Primary energy input data was used to calculate the GHG emissions ($C0_2$, CH_4, N_20) expressed in metric tonnes of carbon dioxide equivalents for each container system. The scope included:

- Container Manufacture and Transport
- Container Washing
- Waste Treatment and Disposal

GHG emissions from all unit process within these four life cycle stages were summed to estimate each container system's carbon footprint.

Emission totals were workload-normalized and analyzed using CHI^2, significance set at $p \leq 0.05$ and rate ratios at 95% CL.

Results

Converting to reusable sharps containers, Loma Linda reduced its annual GHG by 162.4 MTCO2eq, and annually eliminated 50.2 tonnes of plastic disposable sharps containers and 8.1 tonnes of cardboard from the sharps waste stream. See right for result graphs.

Conclusion

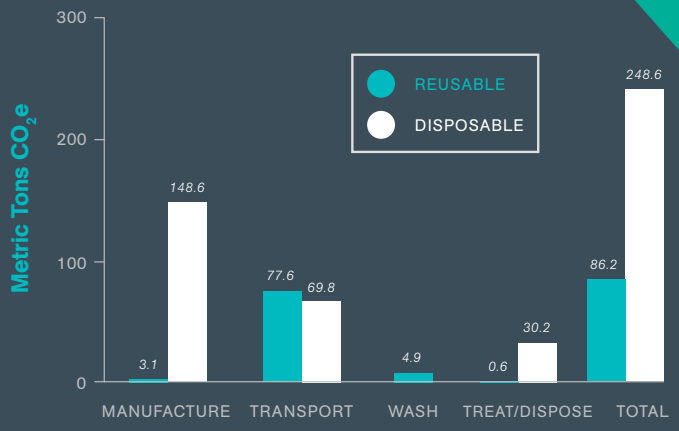
Unlike GHG reduction strategies dependent on changes in staff behaviour, purchasing strategies and the migration from single-use to reusable plastic containment options can enable immediate, sustainable and institution-wide GHG reductions to be achieved.

USN191070

RESULTS

CARBON FOOTPRINT

DISPOSAL VS REUSABLE



GHG COMPARISON

DISPOSAL VS REUSABLE

PER YEAR.	REUSABLE	DISPOSABLE
CONTAINERS MANUFACTURED	3,195	48,460
CONTAINERS LANDFILLED	0	35,925
TONNES OF PLASTIC LANDFILLED	0	31.8
TONNES OF PLASTIC INCINERATED	0.4	18.8
TONNES OF CARDBOARD BOXES	0.1	8.2
CONTAINER EXCHANGES	33,356	48,460
MTCO2eq GWP	86.19	248.62

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