Getting the most from

Life Cycle Assessment

in product development

Single-use auto-injectors create huge amounts of waste. There is a rising population needing injectable medication, resulting in the number of auto-injectors required rising.

There are circa 150 million auto-injectors used per year resulting in an estimated environmental impact equivalent to 9696 gasoline powered cars driven for 1 year*.

Creating products termed as 'single-use', by nature means we take, make and dispose.

There is a growing consumer concern that there is too much waste produced from single-use items and the broad assumption is that dealing with the waste through recycling is the solution to delivering a sustainable future. It is not the waste that directly causes carbon impact but the production of product.

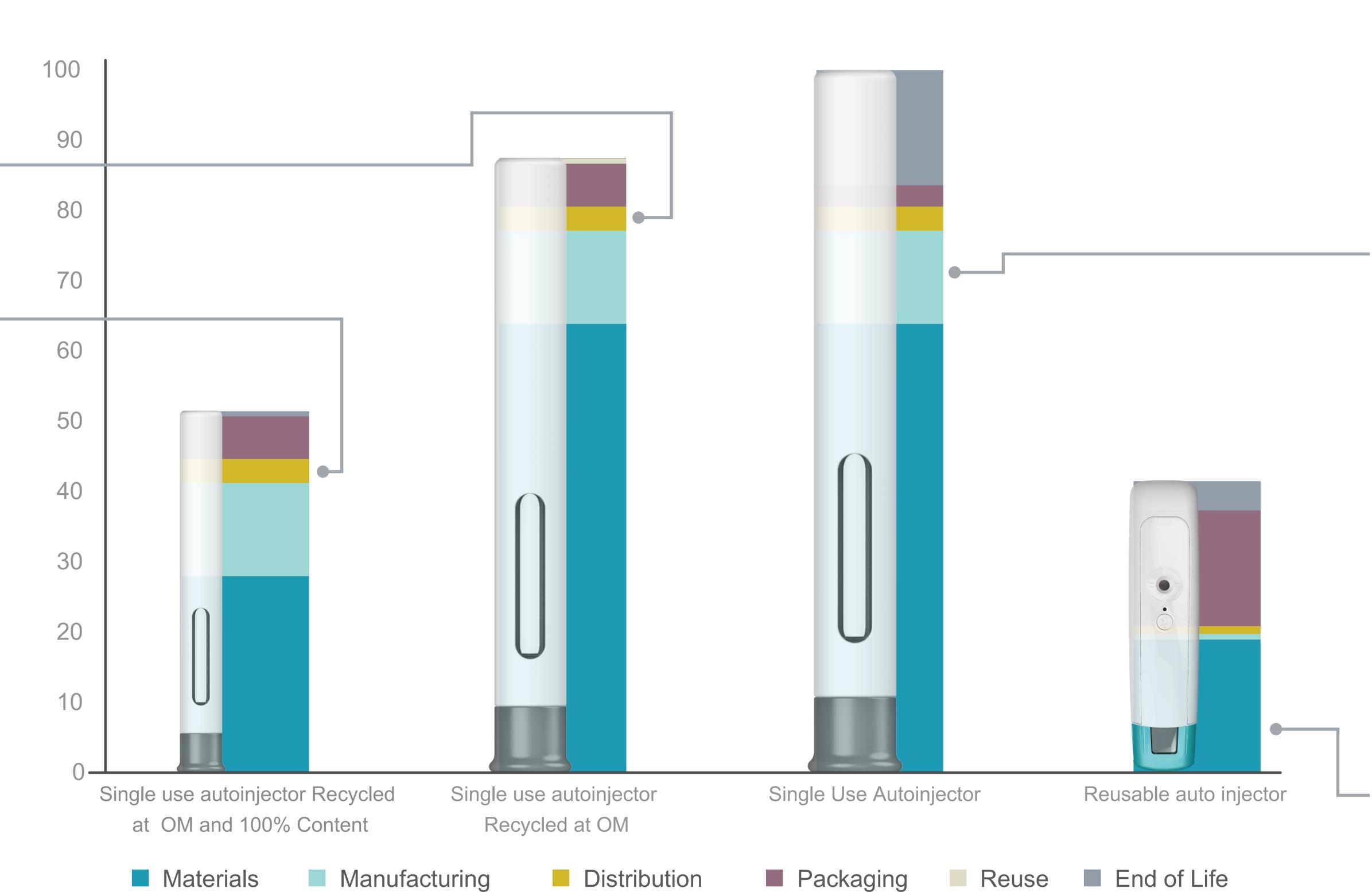
Within these frameworks for sustainability recycling is the last option:

Circular Economy Butterfly Diagram from the Ellen MacArthur Foundation Reduce Renewables flow Minimising generation of water in the first place by repairing and reconditioning whole/part of products Parts Manufacturer Recycle Reuse Biochemical Utilising products again with the same/a feedstock Product Manufacturer Regeneration different purpose with redistribution/resale Service Provider Recycle Disintegrating products and using its components as inputs for new processes/ items Minimise systematic leakage and negative externalities

Recycling is the last option in these frameworks because it does not reduce the environmental impact of products and services to the scale required to reduce CO2 to acceptable levels.

Here is a calculation of the reduction in Global Warming Potential (GWP) achievable through a takeback scheme to recycle at the manufacturer and the same takeback scheme with the device manufactured from 100% recycled polymer:

Note that in LCA, we do not take credit for putting recycled material into another life cycle, and the health care industry is not able to use recycled content in devices.



So, how do we reduce the impact of our products?

We assess the lifecycle hotspots =

Single-use auto-injector

We highlight the life cycle stages with the highest impact = raw material, EoL and manufacturing

What solution reduces all of these?

The Unisafe® 1mL reusable auto-injector reduces all three lifecycle stages

Reusable auto-injector



The UniSafe® 1mL reusable auto-injector achieves 63% reduction in GWP, with a significant raw material, EoL and manufacturing reduction.

The benefits of using a life cycle approach to product development provides credible data and removes the likelihood of creating solutions which do not make real sustainability improvements. The insights can drive your strategy and decision making, for example we can see the packaging has become a hotspot in this scenario, providing an area for development and improvement.

Scope of the LCAs – Use stage excluded as neither device uses energy, instead packaging was measured as a life cycle stage. 'Single-use auto-injector' is based on the Unisafe® 1mL Auto-injector used 182 times (1 injection per week for 3.5 years). Both devices deliver 1m

*https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

